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OPERATION EVEREST II: EFFECTS OF A SIMULATED ASCENT TO 29,000 FEET ON NUTRITION AND BODY COMPOSITION

U S ARMY RESEARCH INSTITUTE
OF
ENVIRONMENTAL MEDICINE
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Pre- to post-exposure hydrostatic weighing indicated that 4 subjects lost 2.7% body fat whereas two subjects gained 0.65%. Computed Tomography scans indicated that most of the body weight loss was from muscle mass. The data indicate that prolonged exposure to increasing hypoxia does not increase CHO preference and that body weight could not be maintained despite provision of a highly palatable ad libitum diet.

HUMAN RESEARCH and DISCLAIMER STATEMENTS

Human subjects participated in these studies after giving their free and informed voluntary consent. Investigators adhered to AR 70-25 and USAMRDC Regulation 70-25 on Use of Volunteers in Research.

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OPERATION EVEREST II:
EFFECTS OF A SIMULATED ASCENT TO 29,000 FEET
ON NUTRITION AND BODY COMPOSITION

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ABSTRACT

Progressive body weight loss occurs during high mountain expeditions, but whether it is due to hypoxia, inadequate diet, malabsorption, or to the multiple stresses of the harsh environment is unknown. To determine whether hypoxia alone causes such body weight loss, six men were studied during progressive decompression to 240 torr for 40 days in a hypobaric chamber where hypoxia was the major variable. The subjects were provided a palatable ad libitum diet that was modified for individual preferences. Complete food consumption data were available for only 38 of the 40 days. Mean caloric intake for 38 days at altitude was 2639 ± 848 kcal/day (Mean \pm SD). Caloric intake decreased 42.3% from 3136 kcal during the first 7 days of exposure to altitude to 1789 kcal during the last 3 days at 282-240 Torr. During the same time periods the carbohydrate (CHO) intake decreased from 62.1% to 53.2% ($p < 0.001$). All subjects lost body weight with a mean loss of 7.44 ± 2.24 kg (8.90% of the initial body weight). Loss of body weight was greater than could be accounted for by comparing calculated energy expenditures to actual caloric intake. Fluid balance data showed no evidence of hypohydration. Pre- to post-exposure hydrostatic weighing indicated that 4 subjects lost 2.7% body fat whereas two subjects gained 0.65%. Computed Tomography scans indicated that most of the body weight loss was from muscle mass. The data indicate that prolonged exposure to increasing hypoxia does not increase CHO preference and that body weight could not be maintained despite provision of a highly palatable ad libitum diet.

INTRODUCTION

CALORIC INTAKE AND BODY WEIGHT

Loss of body weight is common during exposure to high altitude (1-13). Acute mountain sickness (AMS) frequently occurs after rapid ascent to moderate altitude and may cause body weight loss due to anorexia, nausea, vomiting, and dehydration, or it may cause weight gain due to fluid retention. Headache, weakness, and disordered sleep are other symptoms of AMS which interfere with normal activity. Altitude sickness is dependent on elevation, rate of ascent, and acclimation but usually decreases after the first three days (14-22). However appetite suppression and decreased caloric intake can persist for as long as several weeks (1,5,8,9,11). As exposure continues for weeks, normal values for food and water intake have been approached (1,9,18,23). Acclimatization can lessen the severity of AMS at altitude to lead to a lessening of anorexia (1,4,15,20-22) and of weight loss. However, even after the symptoms of AMS have lessened, body weight can remain reduced. Appetite suppression may decrease caloric and protein intake by as much as 30% and 40% respectively (1,5,8,9,11,24) and thus may explain the body weight loss which persists after AMS symptoms have subsided.

Studies of sustained body weight loss are numerous and contradictory and have attributed this loss to reduced dietary intake resulting from anorexia (1,5-13); loss of stored body fat (5,7,11,25,26); loss of body fluid (1-5,11,25,27-30); malabsorption of ingested fat and/or carbohydrate especially at altitudes in excess of 4300 m (4,31,32); and an elevated rate of energy expenditure under basal, resting, and mild to moderate exercise conditions (4,17,18,20,33-39). Body weight loss ranging from 3-5.4% (5,11,40,41) with rates of 145-330 g/day have been reported (11,23,42).

On an actual climb, it is difficult to determine whether body weight loss is due to increased energy expended in hard physical work, the cold environment, the limited availability or palatability of food, dehydration, malabsorption, or combinations of these stresses. Furthermore, lack of time, space, equipment, and interest make precise intake/output measurements very difficult. As a result, expeditions usually only estimate food intake (23,40).

CARBOHYDRATE PREFERENCE

There are a paucity of reports and a conflict of views regarding food preference at altitude (9,13,23,24,29,37,40). Anecdotal evidence from climbers suggests that they prefer sweets at altitude (9,13,23,24,29,40). However, researchers have suggested that the preference for carbohydrate was really due to a greater availability and ease of preparation (23,24). Few studies have determined dietary preferences for carbohydrate at high altitudes when subjects are given (9,37) palatable foods ad libitum.

FOOD RATING

Researchers have not studied food ratings to determine whether the problem is that food does not taste good or whether AMS causes the subject to reduce his food intake no matter how good the food tastes.

BODY COMPOSITION

Although loss in body weight at altitude is common, the composition of the weight loss is unclear. Some investigations show a reduction in body fat (5,11,17,23,25,43,44) while others show a loss in lean body weight (1,45).

The purpose of the present study was to determine if dietary preferences changed and if body weight could be maintained by offering palatable foods ad libitum during a simulated ascent of Mount Everest (240 torr).

METHODS

Nine subjects in excellent physical condition were selected to participate in this study. One subject was excluded at the beginning of the study because of an upper respiratory infection and 2 subjects (#7 & #5) were withdrawn at 18,000 and 25,000 feet, respectively. All of the subjects are described by Houston (46). The subjects were confined in a hypobaric chamber for 40 days during progressive decompression to 240 Torr to simulate previously successful ascents of Mount Everest. Complete dietary data were available on only 6 subjects for 38 days due to incomplete data on the first and last days of confinement.

The subjects were allowed access to any quantity and variety of palatable food. The menus and food preparation were under the supervision of a registered dietitian. The subjects selected three meals per day from menus consisting of approximately 3000 kcal/day (60% CHO, 15% PRO, 25% FAT). The menus included a full breakfast selection, soup and/or sandwich lunches, commercially prepared dinners, simple home-cooked dinners, and food accompaniments to balance meals (Appendix 1). Foods were weighed before being served to the subjects. The returned foods were measured and subtracted from the amount served to accurately measure food intake. Any discrepancies between the menu and food items on the tray were resolved.

A variety of foods were available in the chamber for between meal snacking. Assorted fluids were available ad libitum and subjects were encouraged to drink to prevent dehydration. The subjects recorded any foods and fluids that were ingested between the three meals. The food and fluid intakes were analyzed using the University of Massachusetts Nutrient Data Bank program.

Food ratings were obtained as the subjects consumed the food. They were asked to rate each food item on a hedonic rating scale from 0 to 9 with 9 being "Like Extremely", 1 was "Dislike Extremely", and 0 was "Didn't Try".

The subjects were weighed daily on a physician's scale calibrated to the nearest 1/4 pound. Body heights (cm) were taken at the beginning of the study.

Energy expenditure could not be measured exactly; therefore, the Harris Benedict formula (47) was used to estimate basal energy expenditure (BEE). Because the subjects were confined in a small space, only 20% of BEE was added for daily living activities. The subjects kept a daily log of their voluntary exercises on the treadmill, stationary ladder ergometer, and cycle ergometer. The subjects were encouraged to exercise to a level comparable to that of an actual mountain climbing expedition. The calories expended from these exercises were added to the $BEE + 20\%BEE$ value. Since so many of the tests required exercise, they also were included in the log book of exercise activity. Some of the tests that included extensive exercise regimens were: VO_2max (MAX), Inert Gas (GAS), Muscle Biopsy (MUSCLE), and Swan-Ganz Catheterizations (SG). The energy expenditure calculations were not adjusted for possible changes in rate of energy expenditure due to altitude.

Body composition information was collected at sea level pre- and post-altitude exposure. Body weight, whole body density (hydrostatic weighing), residual lung volume, and anthropometric measurements were obtained preprandial 3 to 6 days prior to and within 20 hours after the chamber confinement. During the hydrostatic weighings, a minimum of six practice trials were performed before three actual readings were recorded to assure a

true baseline. Residual volumes were obtained while the subjects were underwater during the each of the last three readings. Body density was converted to percent body fat (%BF) using the Siri formula (48).

Anthropometric measurements were obtained before noon on each of the measurement days by the same investigator throughout the entire study. Exercise was not permitted 1 hour prior to the anthropometric measurements. This assessment consisted of seven skinfold and 10 soft tissue circumference measurements obtained while subjects were standing. Two non-consecutive measurements were obtained at each site. A third measurement was taken if the difference between the first two was greater than 1%. The mean of the two or three measurements was used in the statistical analysis. Skinfolts were obtained at seven sites on the right side of the body (triceps, scapula, chest, midaxillary, suprailiac, abdomen, and thigh) using a Harpenden skinfold caliper with a caliper pressure of 10 g/mm². Circumferences of the neck, shoulders, chest, hips, thigh, calf, upper arm, forearm, and two abdominal sites were measured using a Gulick spring-loaded tape. The measurement sites were located using standard landmarks.

To quantitatively assess the pattern of fat and muscle distribution (49), computed tomographic (CT) scans were taken of the upper arms and thighs at sea level, pre- and post-altitude exposure. Five 1 cm thick slices were scanned in each limb. In the thigh the center slice was positioned on a mark at mid-point between the tibial tubercle and the anterior superior iliac crest; i.e. mid thigh. In the arm the center slice was positioned on a mark 60% of the distance down from the acromium to the medial condyle of the ulnar. This sampled the thickest part of the upper arm. The area of the

bone, muscle, and fat on each slice was measured with a planimeter interfaced to an IBM personal computer. To allow for possible changes in the CT scanner magnification between the pre and post hypoxia images the fat and muscle content of each slice was expressed as a ratio of fat/bone and muscle/bone. It was assumed that there would be no significant change in the diameter of the ulna or femur in the 42 days between measurements. The data from the 10 slices in both limbs were pooled in each individual. The data presented represent the means of these pooled slices in all individuals.

STATISTICS

Descriptive statistics were run on the 6 subjects that completed the 38 days of the study. Mean \pm SD were calculated for each descriptive measurement. Data for the 2 subjects (#5 & #7) that were withdrawn from the study were included in the charts but were not included in the calculations of the means. Analysis of variance was used to test for significant differences between time periods. The Student Newman Keuls post hoc tests were used to determine where the significant differences occurred.

RESULTS

CALORIC INTAKE AND BODY WEIGHT

The physical characteristics of the subjects on day 2 of the study are described in Table 1. The 38 days for which complete dietary data were available were divided into 7-day periods except for the last period which only included 3 days (Table 2). Grouping the data into 6 periods made it easier to interpret overall trends.

Caloric intake decreased over the 38 days at altitude. Caloric intake during period 1 averaged 3136 ± 557 kcal (Mean \pm SD) and gradually decreased to 1789 ± 682 kcal during period 6 (Table 3). Mean caloric intake averaged 2639 ± 848 kcal/day. The percent decrease in energy intake between Periods 1 and 6 was 42.3% ranging from 23.3 to 62.7% (Table 4). Two subjects (#4 & #6) were able to limit the percent decrease in calories to 28.2 and 23.3%, respectively.

The number of calories expended, time, and number of times per day that the subjects engaged in exercise varied widely (Table 5). The subjects expended more calories exercising during the first half of the study (Figures 1-8). The amount of time spent exercising was higher at the lower altitudes or at the beginning of the study (Figures 9-16).

Average energy requirements ranged from 2372 to 4391 kcal/day (Table 6). Comparing the calculated energy requirements to the energy intake showed that the actual weight loss was greater than expected (Table 7) by as much as 8.2 kg. The mean caloric intake for 4 subjects was less than their calculated energy requirements but the other 2 subjects ingested more calories than were needed to meet their energy requirements (Table 7).

Mean body weight loss for the 38 days was 7.44 ± 2.24 kg ($p < 0.01$) ranging from 4.2 to 9.9 kg (Table 8). The subjects lost $8.9 \pm 2.0\%$ of their sea level body weights. The weight loss ranged from 4.2% to 11.6% of original body weights in 38 days. Body weight was lost at a mean rate of 196 g/day (range 110.5 - 260.5 g/day). Body weight and caloric intake (Figures 17-24) followed the same general downward trend. Overall fluid balance was positive to discount fluid loss as a reason for weight loss (Table 9).

Comparing the value of the highest caloric intake to the lowest value for each subject (Table 10) showed a mean difference of 3268 kcal which could cause a 0.45 kg weight loss/day if continued. The difference between the highest and lowest caloric intakes was significant ($p < 0.01$). The highest values occurred before the minimum values during the course of the study.

Five of the subjects had mean protein intakes that exceeded the RDA of 0.8 g/kg body weight (BW) (Table 11). The protein intake for these 5 subjects fell below the RDA on several days but there were surrounding days with more than adequate protein intakes. For these subjects the days of low protein intakes occurred more frequently in the last two periods of the study. The sixth subject (#1) had a mean protein intake of 83.7 g which was 83.0% of his sea level protein needs. The subject's protein intake was deficient 63.2% or 24 of the 38 days of the study and started occurring in the first period. The mean protein intakes for the six subjects showed a significant decrease ($p < 0.001$) during the second half of the study (Table 11). As the caloric intake decreased, the protein intake also decreased ($r = 0.77$, $p < 0.001$). The percent of calories from protein (%PRO) did not differ significantly except for period 2 which was significantly greater

($p < 0.01$) than the other periods (Table 12). The mean protein intake for all 38 days was $15.4 \pm 3.8\%$ of the total calories.

The mean nutrient intake of the 6 subjects met the Recommended Dietary Allowances (RDA) (50) for all vitamins and minerals (Table 13). However two subjects (#4 & #6) were ingesting vitamin and mineral supplements which artificially increased the mean intake. Excluding the vitamin/mineral supplement from the data showed that the food intake provided enough nutrients to meet the RDA for energy and all vitamins and minerals except for vitamin B₆, folacin, magnesium, and zinc.

CARBOHYDRATE PREFERENCE

The subjects started the study consuming a higher percentage of total calories as carbohydrate (%CHO) in their diets (62.1% CHO); but the %CHO dropped to 54.5% in the second period and remained in that general range for the remainder of the study (Table 14). There was a significant difference ($p < 0.001$) between period 1 and the following periods. As the %CHO decreased, the percent of calories as fat (%FAT) increased ($r = -0.90$, $p < 0.001$) (Table 15, Figure 25).

FOOD RATING

The overall rating of the food showed that the subjects liked the foods very much. The mean rating was very high at 8.4 on the hedonic rating scale. The mean rating for the first half of the study was 8.4 (range 3-10) compared to 8.7 for the second half (range 4-10). The mean ratings showed a slight increase during the second half of the study; however, the amount of food that the subjects ate decreased.

BODY COMPOSITION

According to the hydrostatic weighing measurements, there was an overall 1.6% decrease in %BF pre- to post-exposure to altitude but the difference was not significant (Figure 26). Four of the 6 subjects lost an average of 2.7%BF whereas the other 2 subjects (#8 & #9) gained an average of 0.65%BF. Mean energy expenditure was greater than the energy intake for the 4 subjects whose %BF decreased (Table 7). The 2 subjects that gained %BF were consuming sufficient calories so that they should have gained instead of losing body weight. Calculations of body fat weight (kg) showed a consistent decrease in body fat (Figure 27) for all subjects. Circumference measurements significantly decreased ($p < 0.05$) in the arms and thighs of all subjects (Figures 28-29). Skinfold measurements, which are an indication of subcutaneous fat, decreased in the triceps and thighs except for the 2 subjects (#8 & #9) whose %BF increased according to hydrostatic weighing measurements (Table 16). The sum of all 7 skinfold measurements followed the same trend as hydrostatic weighing with skinfolds decreasing for 4 subjects and increasing for 2 subjects. The CT scan fat/bone data confirmed the trends of the hydrostatic weighing and skinfold data (Figures 30-31). Circumference, %BF, skinfold, and CT scan data showed that body fat decreased except for the 2 subjects (#8 & #9) who had increases in %BF.

Muscle mass decreased (Figures 32-33) in all subjects. CT scan muscle/bone measurements showed that the difference was not significant in the arm ($p < 0.073$) but was significant ($p < 0.002$) in the thigh measurement. Since bone measurements were not expected to change during the 40-day period of the study, change in the ratio was attributed to changes in muscle mass.

DISCUSSION

CALORIC INTAKE AND BODY WEIGHT

Averaging the data into 7-day periods showed that there was a definite downward trend in caloric intake over the six periods. The largest decreases in caloric intake occurred at the higher altitudes. The average decrease in caloric intake of 42.3% from period 1 to period 6 (Table 3) was comparable to the 20-40% range found in the literature for sojourns of up to 26-days duration (5,8,9,24). Two subjects (#4 & #6) were able to maintain their caloric intake at 71.8 and 76.7% of their beginning values. The small decrease in calories for the 2 subjects (#4 & #6) could be due to the fact that they ate less than their energy requirements in the beginning of the study. The body weight losses for the 2 subjects (#4 & #6) were among the higher values with percent body weight loss being equal to 11.6 and 9.7% (Table 8). Since their energy expenditures due to exercise were greater than those of the other subjects, the large body weight losses are to be expected (Figures 1-8). Energy requirements have been shown to be relatively higher for heavy exercise at altitude compared to that at sea level (36). Since these subjects were heavy exercisers, it is possible that the energy expenditure was increased above that predicted by the Harris Benedict equation. Increased energy expenditure coupled with their decreased energy intake could lead to large energy deficits which would lead to the catabolism of body protein and/or fat (1,5,9,11,24,25,38,43). The decrease in caloric intake was less than 50% for four of the subjects. The 4 subjects started the study eating more than their energy requirements. Boyer and Blume (23) had reported that some climbers ate excess amounts of food before starting to

climb a mountain in anticipation of anorexia and body weight loss. The 4 subjects may have been attempting to eat as much as possible at the beginning of the study to increase their body stores and to prevent the debilitating effects of a major weight loss. Their plans seemed to have worked since these subjects lost less weight in comparison to subjects #4 and #6 even though they suffered more from AMS.

Altitude sickness is affected by altitude, speed of ascent, and length of stay. Mild AMS subsides in a few days; high altitude pulmonary edema and high altitude cerebral edema either subside or grow worse and require descent. The longer the stay at altitudes up to 18-20,000 feet, the more complete the acclimatization. However, caloric intake and body weight tend to fall during long stays at altitudes higher than 20,000 feet (4).

The subjects were allowed to acclimate for 3-day periods at 15,000, 18,000, 20,000, and 25,000 feet. The subjects in the present study tended to feel better after each of the three day acclimation periods (46), but nevertheless all subjects lost body weight continuously throughout the study. This suggests that hypobaric hypoxia rather than the combined stresses of the mountain environment may be responsible for a major portion of the deterioration of food intakes during mountain expeditions. Due to the nature of this study, body weight loss was not due to increased climbing activity or to limited food availability. The amount of voluntary exercise decreased drastically for most of the subjects after reaching 23,000 feet on day 26. These results suggested that deterioration in physical condition could override the effects of acclimatization as Pugh (4) and Blume (24) had suggested as early as 1962.

The 8.9% body weight loss in the present study was greater than previously reported. Previous studies have shown weight loss of 3-3.49% in 8 days (5,41); 5.4% in 12 days (11); and 5% in 5 weeks (40) during exposure to altitude. The caloric intake and rate of weight loss for the present study were similar to those of previous studies (11,23,40,42). If the duration of those other studies were extended, the percent body weight loss would be similar to the present study.

All subjects continuously lost body weight during the 38 days at altitude. The mean energy intake for 4 subjects was less than their calculated energy requirements so weight loss was expected. However the other 2 subjects (#8 & #9) ingested more calories than were needed to meet their energy expenditure and should have gained body weight (Table 7). The weight loss for all subjects was greater than would be expected from the energy intake and expenditure figures. The reason for the disparity in body weight losses may simply be a question of the accuracy of the estimation of energy expenditure since energy intake was accurately determined. The subjects with caloric intakes greater than their energy requirements did tend to have smaller body weight losses. Other researchers have suggested that body weight loss may be due to water loss, increased metabolic rates, and fat and/or carbohydrate malabsorption (4,23). Hypohydration may be due to decreased fluid intake (1); increased water loss (2,3,4,11,27); or loss of fluid from the lungs due to hyperventilation (28,29). However, other studies have shown that normal body hydration can be maintained (5,25,30). The fluid data for the present study showed that the subjects were in a slightly positive balance (Table 9). Fluid intake exceeded the output by several

hundred milliliters. However losses of fluid from hyperventilation and sweating were not taken into account and would probably decrease the positive fluid balance to euhydration. Body fluid losses were probably minimized because the relative humidity in the hypobaric chamber ranged from 60 to 80% depending on the altitude. In general the fluid balance was negative during the last two periods of the study (Table 17, Appendix 2). The negative fluid balance could account for the continued weight loss of subjects #8 and #9 who should have gained weight according to energy balance calculations. Several researchers have suggested that energy expenditure increases at altitude (17,18,39). The effects of altitude on basal (4,17,33), resting (34,35,39), and mild to moderate exercise (35,36) conditions have been studied and show an increase of 7-11% of energy expenditure at altitude. The increase in energy expenditure has been attributed to the increased work of breathing or the decreased efficiency of work performance. However data from other studies show that the increase in basal energy expenditure is transient and returns to normal after about a week of acclimatization (4,20,37,38).

The possibility that malabsorption due to hypoxia was an important cause of body weight loss has been debated (4,23,31,32) but was not investigated in this study. On mountain expeditions food intake and energy output have only been estimated (23,24) and not at altitudes as high as attained in the present study. Rai et al. (32) and Sridharan (31) showed no disturbance in digestibility and utilization of dietary fat and/or carbohydrate up to 4700 m. Other studies have reported malabsorption of fat and/or xylose (4,23) at higher altitudes. Increased energy expenditure/metabolic rates and/or malabsorption could account for the body weight losses but neither were studied.

The confinement of the 8 subjects in a hypobaric chamber in the present study could have affected body weight loss. Loss of appetite, body weight, and strength could be attributed to confinement in the hypobaric chamber, isolation from the real world, limited physical activity, and boredom. However evidence was not available on the interaction of these factors with body weight and appetite loss. A study of 245 crew members confined to 4 submarines showed that 67% of the personnel lost weight, 25% gained weight, and 8% maintained their weight during long sea voyages even though the food was considered very palatable and exercise decreased (51). The authors attributed the weight loss of a third of the crew members to active dieting but the psychological and physical stresses of confinement may have contributed to the weight loss of the remainder of the crew members (51).

Negative nitrogen balances have been reported in humans exposed to high altitudes (1,41). Under normal conditions, the RDA for protein of 0.8 g/body weight (50) is more than adequate for maintaining nitrogen balance. When energy intakes were less than 2000 kcal/day, nitrogen balance studies on protein intakes of greater than 50-60 g/day were negative during altitude exposure (1,8,38,41). Negative nitrogen balances during caloric deficiency were probably due to protein being used to meet the energy needs of the body (45). Studies have shown that whenever men consumed adequate calories and protein during altitude exposure, positive nitrogen balances were possible (37,42). However decreased appetite usually leads to a decrease in dietary caloric and protein levels (5,8,9,24,41). Nitrogen balance studies were not conducted but five subjects received more than the RDA for protein while one subject (#1) ingested less than the RDA for protein. In the present study

the mean caloric intakes for 2 subjects (#8 & #9) were adequate to meet energy requirements but the levels were inadequate for the other 4 subjects (Table 7). The subjects were able to ingest an average of 2152-3022 kcal but their energy requirements ranged from 2314 to 2901 kcal. Four subjects in the present study were probably in negative nitrogen balance because of their caloric deficits. The 2 subjects receiving adequate calorie and protein intakes were probably in positive nitrogen balance (42).

Hannon (52) has concluded that extended periods of low protein intakes are unlikely to present serious nutritional problems since the protein intakes during the most pronounced stages of hypophagia usually exceeded the RDA of 0.8 g/kg BW. This conclusion was not supported by the results of the present study. Protein intake averaged 0.86 g/kg BW for the last period of the study but 2 subjects (#1 & #3) had protein intakes as low as 0.52-0.67 g/kg BW for the last 2 periods of the study. These 2 subjects were probably in negative nitrogen balance. Protein intake decreased on one day to 26.2 g for one of those subjects (#1) whose protein intake for the entire study was deficient 63.2% of the time.

Hypophagia can last from 8-28 days (1,5,8,23,38) at altitude although clinical evidence of nutritional deficiency other than a negative nitrogen balance has not been reported. It has been suggested that subjects starting in a good nutritional state would not develop vitamin and mineral deficiency problems for several months (52). However the duration of the hypophagia and anorexia of AMS may indicate a need for vitamin/mineral supplementation for subjects on lengthy expeditions who are exercising heavily and whose diets are unbalanced.

CARBOHYDRATE PREFERENCE

Several studies have shown that subjects prefer carbohydrate at high altitude, usually at the expense of fat (4,18,37). Consolazio et al. (37) showed that this was true during the first week at altitude but a similar pattern was not apparent during prolonged exposure. The present study confirmed these findings. Though a high carbohydrate (60%) diet was offered throughout the study, the subjects started at 62.1% and then decreased their carbohydrate intake to 53.2%, although the menu choices were adequate to have maintained or even increased carbohydrate intakes. Others (14,23) have found intakes of carbohydrate to increase from 42-55% at sea level to 52-63% at altitude. In the present study, a wide variety of appetizing foods were readily available to the subjects and they consumed a more balanced diet than usually available to mountaineers. The composition of the diet for the entire study was 54.5% CHO, 15.2% PRO, and 31.4% FAT. In 1969, Kryzwicki et al. (11) observed similar body weight losses whether the subjects consumed a high carbohydrate (68%) or a low (42%) carbohydrate diet during 12 days at 4300 m. Increased dietary carbohydrate intake did not decrease body weight loss. Consolazio et al. (18) found a difference in work performance for the heaviest work levels with a high carbohydrate diet at high altitude. Carbohydrate may increase the blood oxygen transport capacity and improve metabolic efficiency (53,54). This may effectively decrease the physiological altitude by 1-2000 feet (55) and make physiological exertion relatively easier. The subjects in the present study did not increase or maintain their intake of carbohydrate.

The subjects did not eat pure fat such as butter but they did eat foods containing large amounts of fat such as ice cream, cream soup, whole milk, meat, and french fries. Although they asked for high carbohydrate snacks such as candy, granola bars, etc, these food also contain large amounts of fat. The preference may not be for pure carbohydrate but a desire for palatability resulting from the combination of carbohydrate and fat.

FOOD RATINGS

The high hedonic ratings indicted that the subjects liked the foods. The food was palatable but at higher altitudes the subjects' appetites were diminished compared to their appetites at lower altitudes (Table 18). Toward the end of the study the subjects ate less food but the foods selected were more calorically dense. The low calorie vegetables and salads were not requested as often. Caloric intake was greater than energy requirements on some days indicating that the subjects were attempting to increase their caloric intake (Figures 17-24). Some subjects were able to consume enough food to keep their caloric intake above their energy requirements right up to the 36th day of the study. It was possible to encourage the subjects to ingest more calories but they could not sustain the high intake. Sore throats, feeling full, not hungry, and the problem of eating while struggling to breathe were reasons given by the subjects for their reduced food consumption. Many foods which were favorites at sea level were not tolerated at higher altitudes.

The mean ratings for the different food groups generally increased (Table 19) as the study progressed. The fruit and juice, potato, bread, vegetable, and meat groups had more food items whose rating increased toward the end of

the study (Table 19). The ratings for potatoes increased for all subjects. However the potatoes were usually combined with cheese and other high protein and high fat additives and many variations were possible. The ratings decreased for the foods that were available throughout the study. The subjects were offered the foods at least five times during the course of the study. They were provided other foods as requested. The decrease was more likely due to boredom rather than an inability to tolerate the foods.

The food ratings of one subject (#9) increased for all foods during the study (Table 19). This subject also was able to minimize his weight loss (Figure 24). His mean caloric intake was greater than his energy requirements so his ability to keep his weight loss minimized was probably due to the high food intake rather than water retention especially since his fluid balance was negative during the last period of the study.

BODY COMPOSITION

There was a mean decrease in body weight, %BF, body fat weight, and LBM. Percent body fat measurements by hydrostatic weighing, skinfold measurements, and CT scanning increased in 2 subjects (#8 & #9). The fact that these 2 subjects (#8 & #9) ate more calories than they needed for energy expenditure and reduced their exercise provided support for the possibility that subcutaneous fat was maintained or increased slightly. In general the present study confirmed the results of previous studies (25,43) that showed losses in skinfold thickness and %BF (5,11,17,44). Although there was an mean decrease in skinfold thickness and %BF in the present study, there was a wide range from 2 subjects (#8 & #9) who showed increases in skinfold measurements and %BF to subjects who showed losses up to 33% in skinfold

thickness. Fulco (56) reported an increase in the %BF determined by hydrostatic weighing after an 18-day exposure to 14,100 ft in a hypobaric chamber. However, the increase in %BF may be misleading. The 1.1% increase in %BF in the Fulco (56) study may have occurred because the amount of fat did not change even though the subjects lost 1.5 kg body weight. The subjects in the present study lost body weight also. Analyzing the body fat weight of the subjects in the present study showed that all subjects lost body fat but the loss was very small for 2 subjects (#8 & #9). Skinfold measurements increased verifying the increase in subcutaneous fat (Table 16). Mountain climbing expeditions have never reported increases in %BF. This difference is probably due to the fact that the subjects in the hypobaric chamber were not exercising as much or in the same manner as would occur during an actual assault on a mountain.

About 25.8% of the 7.44 kg of weight lost by the subjects was from fat and 74.2% from the LBM. The most common percentage of fat loss was approximately 40% but adding the values of the 2 subjects (#8 & #9) who gained %BF lowered the percent attributed to fat considerably. Since the subjects were not dehydrated and bone was not expected to change, the 74.2% loss from LBM was from muscle mass. The CT scans confirmed the decreases in muscle mass.

The CT scans and the measurements of %BF, skinfold, and circumference presented an integrated picture of the changes in body composition. The overall trend was of decreasing muscle mass and body fat except for 2 subjects (#8 & #9) who actually gained fat.

CONCLUSIONS

Conclusions from this study were: (1) energy output decreased as altitude increased; (2) food intake decreased as altitude increased; (3) fluid balance indicated little or no dehydration or edema in most subjects most of the time; (4) essential vitamins and minerals and protein were not deficient except for protein for one subject; (5) lack of oxygen, lack of adequate exercise, and confinement may have caused anorexia which contributed to body weight loss; (6) the amount of body weight loss can not be accounted for by balance of caloric intake vs energy expenditure indicating that there might have been malabsorption or increased energy expenditure that has not been taken into account; (7) %BF decreased in 4 subjects but increased in 2 subjects whose caloric intake indicated that they should have gained weight; (8) body fat weight decreased in all subjects; and (9) LBM decreased.

The data indicate that prolonged exposure to increasing hypoxia does not increase carbohydrate preference and that body weight could not be maintained despite provision of a highly palatable ad libitum diet.

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TABLES

Table 1
Physical Characteristics of Subjects *

	Mean + SD	Range
Age, years	27.5 + 2.2	25.0 - 31.0
Height, cm	184.0 + 10.3	171.4 - 196.8
Weight, kg (7 Oct)	82.97 + 9.78	74.09 - 100.91

*Excluding subjects 5 & 7

Table 2

OPERATION EVEREST II PERIODS

PERIOD	DAY OF STUDY
1	2 - 8
2	9 - 15
3	16 - 22
4	23 - 29
5	30 - 36
6	37 - 39

Table 3

Energy Intake (Kcal/Day)

Subject Number	Period (Study Days)						Mean
	1 (2-8)	2 (9-15)	3 (16-22)	4 (23-29)	5 (30-36)	6 (37-39)	
1	3570	2874	2658	2450	1643	1332	2536
3	2864	2662	2447	1934	1289	1137	2152
4	2650	2833	2712	2658	2634	1903	2635
5	3252	2867	2499	2516	1868		2695
6	3107	3108	3112	2136	2471	2383	2755
7	2672	2024					2373
8	3447	3533	3353	2615	2695	1773	3022
9	3178	2935	2861	2191	2742	2206	2736
Mean ^a	3136 ^b	2991 ^b	2857 ^b	2331	2246	1789 ^a	2639
Std Dev ^c	557	664	788	804	874	682	847.6

^a Excluding Subjects 5 & 7

^a Significantly different from other periods

^b Significantly different from periods 4 & 5

p < 0.001

Table 4

Percent Decrease in Energy Intake

Subject Number	% Decrease in Kcalories
1	62.7 ^a
3	60.3 ^a
4	28.2 ^a
5	42.6 ^b
6	23.3 ^a
7	24.3 ^a
8	48.6 ^a
9	30.6 ^a
<u>Mean^c</u>	<u>42.3^a</u>
SD	17.2

- ^a Excluding subjects 5 & 7
- ^a Difference between Period 1 & 6
- ^b Difference between Period 1 & 5
- ^c Difference between Period 1 & 2

Table 5

Operation Everest II

Daily Energy Expenditure from Exercise
(Study Day 4 to 39)

Subject Number	Calories		Exercise Time		Frequency of Exercise
	Mean	SD	Mean	SD	
1	315	325	32.0	31.2	0.92
3	206	218	23.6	27.1	0.72
4	1986	1045	211.5	96.5	2.53
5	466	323	47.6	25.7	1.55
6	1053	509	118.1	50.8	2.17
7	889	654	91.5	48.8	1.25
8	638	699	69.2	63.7	2.00
9	236	234	28.2	27.5	1.00
Mean*	715	807	76.5	81.2	2.11

* excluding subjects 5 & 7

Table 6

OPERATION EVEREST II AVERAGE ENERGY REQUIREMENTS

SUBJECT NUMBER	BEE	BEE + 20% ACTIVITY	EXTRA ACTIVITY	BEE + 20% ACTIVITY + EXTRA ACTIVITY
1	2232	2678	315	2993
3	1846	2215	206	2421
4	2004	2405	1986	4391
5	1600	1920	466	2386
6	1918	2302	1053	3355
7	1773	2128	889	3017
8	1781	2137	638	2775
9	1781	2137	235	2372

Table 7

Energy Balance and Weight Change in 38 Days

Subject Number	Energy Requirement (Kcal)	Energy Intake (Kcal)	Change in Body Weight (kg)	
			Expected	Actual
1*	2993	2536	-2.3	-9.9
3*	2421	2152	-1.3	-6.1
4*	4391	2635	-8.7	-9.8
5**	2386	2695	+2.7	-1.7
6*	3355	2755	-3.0	-8.2
7***	3017	2373	-2.4	-2.9
8*	2775	3022	+1.2	-6.5
9*	2372	2736	+4.0	-4.2

* October 7 to November 13, 1985

** October 7 to November 7, 1985

*** October 7 to October 19, 1985

Table 8
Operation Everest II
 Weight Loss in 38 Days

Subject Number	Initial Weight Oct 7, 1985 (kg)	Final Weight Nov 13, 1985 (kg)	Difference (kg)	Weight Loss (%)
1	100.91	91.02	9.89	9.8
3	76.70	70.57	6.14	8.0
4	84.43	74.66	9.77	11.6
5	59.43	57.73 ^a	1.70	2.4
6	84.55	76.36	8.18	9.7
7	72.73	69.77 ^b	2.96	4.1
8	77.16	70.68	6.48	8.4
9	74.09	69.89	4.20	5.7
Mean ^c	82.97	75.53	7.44 ^c	8.9
SD	9.78	8.02	2.24	2.0

^a Nov 7, 1985

^b Oct 19, 1985

^c Significantly different, $p < 0.01$
 . Excluding Subjects 5 & 7

TABLE 9

OPERATION EVEREST II

FLUID BALANCE

Subject Number	Fluid Intake (ml/day)	Fluid Output (ml/day)	Balance
1	2464.4	1881.3	583.1
3	1906.8	1835.3	71.5
4	3854.1	3540.4	313.7
6	5448.5	5252.5	196.0
8	3928.3	3432.1	496.2
9	2199.2	2078.3	120.9
Mean	3278.5	3074.6	203.9
SD	1618.2	1527.3	1220.7

Table 10

Operation Everest II

Subject	Extremes of Energy Intake		Difference
	Maximum (Kcal)	Minimum (Kcal)	
1	4331	988	3343
3	3551	558	2993
4	5580	1611	3969
5	3916	1670	2246
6	4450	1269	3181
7	3600	1394	2206
8	4485	884	3601
9	4001	1483	2518
Mean*	4399.7	1132.2	3267.5
SD	+676.3	+395.8	+500.7

* excluding subjects 5 & 7

Table 11

Protein Intake (Grams/Day)

Subject Number	Period (Study Days)						Mean
	1 (2-8)	2 (9-15)	3 (16-22)	4 (23-29)	5 (30-36)	6 (37-39)	
1	115.0	108.6	90.0	66.6	54.0	47.5	83.7
3	111.2	114.0	91.7	80.1	47.4	47.4	85.6
4	127.5	150.8	127.5	126.4	106.1	66.6	122.9
5	116.6	102.7	75.5	73.9	65.4		89.6
6	93.4	126.8	121.3	90.4	92.7	71.6	102.3
7	101.6	87.4					95.0
8	108.5	135.8	106.9	98.5	103.2	66.1	107.1
9	102.7	121.9	102.9	83.2	95.3	84.6	99.9
Mean ^a	109.7 ^b	126.3 ^b	106.7 ^b	90.9	83.1	64.0 ^a	100.2
Std Dev	19.9	35.2	33.8	33.5	36.0	26.3	36.3

^a Excluding subjects 5 & 7

^a Significantly different from other periods

^b Significantly different from periods 4 & 5

p < 0.001

Table 12

Operation Everest II

Percent Calories from Protein

Subject Number	Period (Study Days)					
	1 (2-8)	2 (9-15)	3 (16-22)	4 (23-29)	5 (30-36)	6 (37-39)
1	12.9	14.8	13.1	10.9	13.2	14.7
3	15.6	17.2	15.6	17.0	14.7	16.1
4	19.3	22.0	19.1	20.3	16.9	13.9
5	14.3	14.2	12.0	11.9	14.0	
6	12.1	16.3	15.8	18.1	14.9	11.5
7	15.8	17.2				
8	12.7	15.4	12.7	15.1	15.9	14.6
9	12.9	16.3	14.6	15.0	13.8	15.4
Mean*	14.3	17.0**	15.1	16.0	14.9	14.3
Std Dev	3.1	3.6	3.7	4.8	3.9	2.6
						3.8

* Excluding subjects 5 & 7

** Significantly different, $p < 0.01$

TABLE 13

OPERATION EVEREST II
MEAN NUTRIENT INTAKE FOR 38 DAYS

	RDA	MEAN INTAKE
Energy (kcal)		2639 \pm 848
Protein (gm)	56	100 \pm 36.3
(%)		15.4 \pm 3.9
Total Fat (gm)		92.3 \pm 44.7
(%)		31.1 \pm 9.5
Fat, saturated (gm)		36.2 \pm 20.7
Fat, monounsaturated (gm)		30.9 \pm 17.3
Fat, polyunsaturated (gm)		13.7 \pm 9.6
Cholesterol (mg)		380 \pm 272
Carbohydrate (gm)		359 \pm 127
(%)		54.5 \pm 9.6
Vitamin A (mcg RE)	1000	2877 \pm 1951
Thiamin (mg)	1.4	6.58 \pm 9.2
Riboflavin (mg)	1.6	7.20 \pm 9.29
Niacin (mg NE)	18	35.5 \pm 17.9
Vitamin B ₆ (mg)	2.2	6.25 \pm 9.1
Vitamin B ₁₂ (mcg)	3.0	10.2 \pm 10.1
Vitamin C (mg)	60	505 \pm 457
Folacin (mcg)	400	67109 \pm 149319
Sodium (mg)		3645 \pm 1387
Potassium (mg)		4001 \pm 1657
Iron (mg)	10	26.5 \pm 16.0
Calcium (mg)	800	1444 \pm 691
Phosphorus (mg)	800	1654 \pm 622
Magnesium (mg)	350	378 \pm 190
Zinc (mg)	15	20.3 \pm 14.9

Table 14

Percent Calories from Carbohydrates

Subject Number	Period (Study Days)						Mean
	1 (2-8)	2 (9-15)	3 (16-22)	4 (23-29)	5 (30-36)	6 (37-39)	
1	61.8	50.8	54.5	55.7	51.6	54.3	54.9
3	62.6	54.4	54.5	52.8	56.4	54.5	56.1
4	67.5	64.6	55.4	57.2	59.0	50.6	59.9
5	63.3	58.0	59.1	60.4	61.1		60.3
6	68.0	54.3	55.4	52.3	54.4	51.2	57.0
7	59.7	51.2					55.8
8	54.0	47.9	47.4	43.5	37.3	55.0	46.8
9	58.5	49.9	56.2	53.6	45.0	53.4	52.5
Mean*	62.1**	54.5	53.2	52.9	50.6	53.2	54.5
SD	7.1	9.0	9.1	9.6	10.5	7.0	9.6

* Excluding subjects 5 & 7

** Significantly different, $p < 0.001$

Table 15

Operation Everest II

Percent Calories from Fat

Subject Number	Period (Study Days)					
	1 (2-8)	2 (9-15)	3 (16-22)	4 (23-29)	5 (30-36)	6 (37-39)
1	24.4	31.3	36.7	32.0	34.9	30.4
3	23.9	27.8	31.4	32.7	29.3	30.3
4	15.9	17.9	29.0	23.1	26.4	36.7
5	23.4	28.3	31.5	28.5	25.8	
6	23.1	28.8	31.8	30.6	30.7	39.4
7	25.2	30.9				27.9
8	34.1	36.3	42.1	42.5	46.9	30.7
9	29.2	32.1	31.3	31.2	40.8	30.3
Mean*	25.1**	29.2	33.7	32.0	34.8	33.0
Std Dev*	7.5	8.5	9.7	9.0	10.5	7.9
						9.5

* Excluding subjects 5 & 7

** Significantly different, $p < 0.001$

TABLE 16

SKINFOLD MEASUREMENTS (mm) Pre- and Post-exposure to 40 Days of Progressive Decompression to 240 Torr

Site	Time	#1	#3	#4	#5 ^a	#6	#7 ^b	#8	#9
Triceps	Pre	9.8	9.9	9.7	7.9	7.0	7.9	8.6	8.8
	Post	9.1	9.2	7.9	7.3	5.7	-	8.8	8.2
Subscapular	Pre	11.7	13.8	7.7	6.3	11.0	7.9	7.5	8.7
	Post	11.1	12.8	6.5	6.3	9.3	-	7.8	11.2
Chest	Pre	6.3	6.3	4.2	3.8	4.4	4.9	4.4	5.9
	Post	6.1	6.5	4.2	4.4	3.9	-	5.9	5.7
Midaxillary	Pre	9.3	12.8	5.1	4.7	6.1	5.0	8.2	10.1
	Post	7.5	9.5	3.8	4.6	4.6	-	7.4	10.2
Suprailiac	Pre	13.9	22.7	12.2	5.9	8.5	12.7	8.4	14.3
	Post	12.5	18.4	6.1	6.5	6.9	-	12.9	13.8
Abdominal	Pre	22.9	21.1	10.5	7.1	8.7	11.5	8.0	20.7
	Post	19.8	17.4	9.4	8.2	6.4	-	13.5	23.1
Thigh	Pre	12.5	18.0	15.5	7.3	9.6	8.0	12.4	12.4
	Post	12.3	16.1	11.1	9.0	7.3	-	14.1	12.7
TOTAL	Pre	86.4	104.6	64.9	43.0	55.3	57.9	57.5	80.9
	Post	78.4	89.9	49.0	46.3	44.1	-	70.4	84.9

^aWithdrawn on 33rd day.^bWithdrawn on 16th day.

Table 17

Operation Everest II

Average Fluid Balance (ml/day)

Subject Number	Period (Study Days)						Mean
	1 (2-8)	2 (9-15)	3 (16-22)	4 (23-29)	5 (30-36)	6 (37-39)	
1	1090.8	820.0	825.0	1035.0	47.9	-903.3	583.1
3	713.3	22.1	67.9	-21.0	37.5	-866.7	71.5
4	2125.0	-24.2	-217.1	292.0	-5.7	-613.3	313.7
5	1092.5	727.9	77.9	-724.0	-516.7		250.9
6	814.0	876.4	762.1	-734.0	-357.9	-900.0	196.0
7	419.0	-26.7					251.9
8	2471.7	1149.3	-266.4	-129.0	-202.1	-528.3	496.1
9	984.2	-26.4	402.1	359.2	323.6	-2868.3	120.8
Mean [*]	1382.3 ^{**}	481.6	262.3	111.2	-27.7	-1113.3 ^{**}	296.1
SD	1188.6	1049.7	1031.9	870.0	993.4	1641.0	1259.5

* excluding subjects 5 & 7

** Significantly different from other groups
p < 0.05

TABLE 18

TRENDS IN FOOD RATINGS AND NUMBER OF FOOD GROUPS CONSUMED

SUBJECT CONSUMED	MEAN RATING	NUMBER OF FOODS
1	+	-
3	=	-
4	+	-
6	+	-
8	+	-
9	+	-

⁺Measurement increased from the first half of the study to the second half.

⁼Measurement remained the same.

⁻Measurement decreased from the first half of the study.

TABLE 19
TRENDS IN RATINGS OF DIFFERENT FOOD GROUPS

SUBJECT	VEGETABLE	SALAD	MEAT	BREAD	SWEETS	DESSERTS	POTATOES	CHICKEN
1		-	+	-	+		+	
3	--	+	+	+	+	-	+	
4	++	+	-	+	=		+	
6		+	+	-	+		+	+
8	++	+	-	+	-	+	+	+
9		+	+	+		+	+	

⁺Measurement increased from the first half of the study to the second half.

⁼Measurement remained the same.

⁻Measurement decreased from the first half of the study.

FIGURES

FIGURE LEGENDS

- Figure 1. Energy (kcal) expended in ladder ergometer, treadmill walking, and biking exercises from information in the daily log book of exercise activity. Value included in energy expenditure calculations for Subject 1.
- Figure 2. Energy (kcal) expended in ladder ergometer, treadmill walking, and biking exercises from information in the daily log book of exercise activity. Value included in energy expenditure calculations for Subject 3.
- Figure 3. Energy (kcal) expended in ladder ergometer, treadmill walking, and biking exercises from information in the daily log book of exercise activity. Value included in energy expenditure calculations for Subject 4.
- Figure 4. Energy (kcal) expended in ladder ergometer, treadmill walking, and biking exercises from information in the daily log book of exercise activity. Value included in energy expenditure calculations for Subject 5.
- Figure 5. Energy (kcal) expended in ladder ergometer, treadmill walking, and biking exercises from information in the daily log book of exercise activity. Value included in energy expenditure calculations for Subject 6.
- Figure 6. Energy (kcal) expended in ladder ergometer, treadmill walking, and biking exercises from information in the daily log book of exercise activity. Value included in energy expenditure calculations for Subject 7.
- Figure 7. Energy (kcal) expended in ladder ergometer, treadmill walking, and biking exercises from information in the daily log book of exercise activity. Value included in energy expenditure calculations for Subject 8.
- Figure 8. Energy (kcal) expended in ladder ergometer, treadmill walking, and biking exercises from information in the daily log book of exercise activity. Value included in energy expenditure calculations for Subject 9.
- Figure 9. Time spent exercising each day for Subject 1.
- Figure 10. Time spent exercising each day for Subject 3.
- Figure 11. Time spent exercising each day for Subject 4.
- Figure 12. Time spent exercising each day for Subject 5.
- Figure 13. Time spent exercising each day for Subject 6.

- Figure 14. Time spent exercising each day for Subject 7.
- Figure 15. Time spent exercising each day for Subject 8.
- Figure 16. Time spent exercising each day for Subject 9.
- Figure 17. Subject 1: Comparison of daily energy intake, energy expenditure, and body weight changes. Arrows indicate exercise bouts during testing that may have interfered with eating ie: Muscle Biopsy (MUSCLE), $VO_2\text{max}$ (MAX), Inert Gas (GAS), and Swan-Ganz Catheterization (SG).
- Figure 18. Subject 3: Comparison of daily energy intake, energy expenditure, and body weight changes. Arrows indicate exercise bouts during testing that may have interfered with eating ie: Muscle Biopsy (MUSCLE), $VO_2\text{max}$ (MAX), Inert Gas (GAS), and Swan-Ganz Catheterization (SG).
- Figure 19. Subject 4: Comparison of daily energy intake, energy expenditure, and body weight changes. Arrows indicate exercise bouts during testing that may have interfered with eating ie: Muscle Biopsy (MUSCLE), $VO_2\text{max}$ (MAX), Inert Gas (GAS), and Swan-Ganz Catheterization (SG).
- Figure 20. Subject 5: Comparison of daily energy intake, energy expenditure, and body weight changes. Arrows indicate exercise bouts during testing that may have interfered with eating ie: Muscle Biopsy (MUSCLE), $VO_2\text{max}$ (MAX), Inert Gas (GAS), and Swan-Ganz Catheterization (SG).
- Figure 21. Subject 6: Comparison of daily energy intake, energy expenditure, and body weight changes. Arrows indicate exercise bouts during testing that may have interfered with eating ie: Muscle Biopsy (MUSCLE), $VO_2\text{max}$ (MAX), Inert Gas (GAS), and Swan-Ganz Catheterization (SG).
- Figure 22. Subject 7: Comparison of daily energy intake, energy expenditure, and body weight changes. Arrows indicate exercise bouts during testing that may have interfered with eating ie: Muscle Biopsy (MUSCLE), $VO_2\text{max}$ (MAX), Inert Gas (GAS), and Swan-Ganz Catheterization (SG).
- Figure 23. Subject 8: Comparison of daily energy intake, energy expenditure, and body weight changes. Arrows indicate exercise bouts during testing that may have interfered with eating ie: Muscle Biopsy (MUSCLE), $VO_2\text{max}$ (MAX), Inert Gas (GAS), and Swan-Ganz Catheterization (SG).

- Figure 24. Subject 9: Comparison of daily energy intake, energy expenditure, and body weight changes. Arrows indicate exercise bouts during testing that may have interfered with eating ie: Muscle Biopsy (MUSCLE), VO_2 max (MAX), Inert Gas (GAS), and Swan-Ganz Catheterization (SG).
- Figure 25. Composition of diet.
- Figure 26. Percent body fat changes pre- to post-exposure to 29,000 feet as determined by hydrostatic weighing.
- Figure 27. Body fat weight (kg) changes pre- to post-exposure to 29,000 feet calculated from body weight and percent body fat.
- Figure 28. Circumference measurements of the arm to determine girth changes pre- to post-exposure to high altitude.
- Figure 29. Circumference measurements of the thigh to determine girth changes pre- to post-exposure to high altitude.
- Figure 30. Computed tomographic (CT) scans of the arm to determine changes in fat due to exposure to high altitude.
- Figure 31. Computed tomographic (CT) scans of the thigh to determine changes in fat due to exposure to high altitude.
- Figure 32. Computed tomographic (CT) scans of the arm to determine changes in muscle mass due to exposure to high altitude.
- Figure 33. Computed tomographic (CT) scans of the arm to determine changes in muscle mass due to exposure to high altitude.

Figure 1
Operation Everest II
Energy Expenditure from Exercise
Subject 1

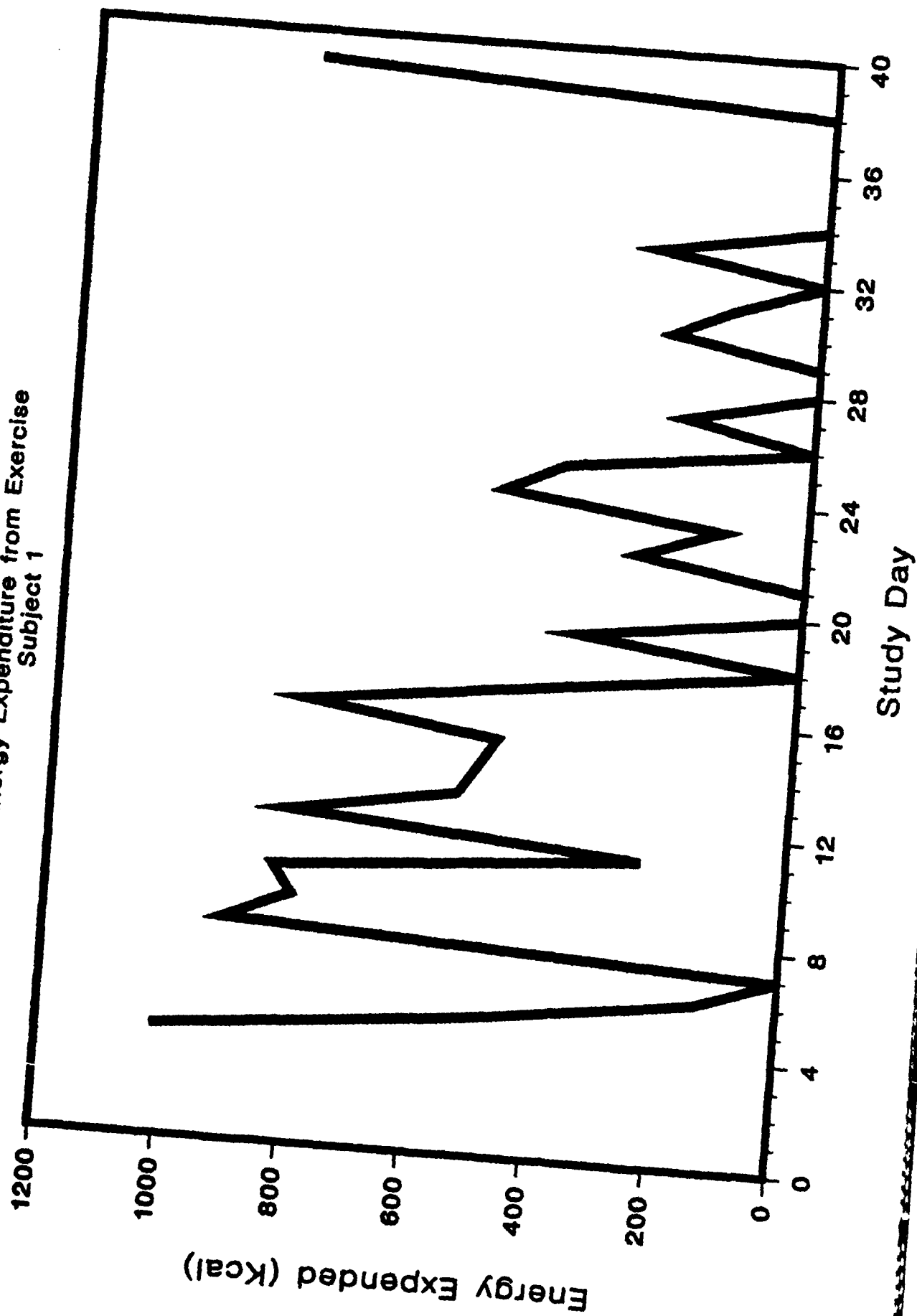


Figure 2
Operation Everest II
Energy Expenditure from Exercise
Subject 3

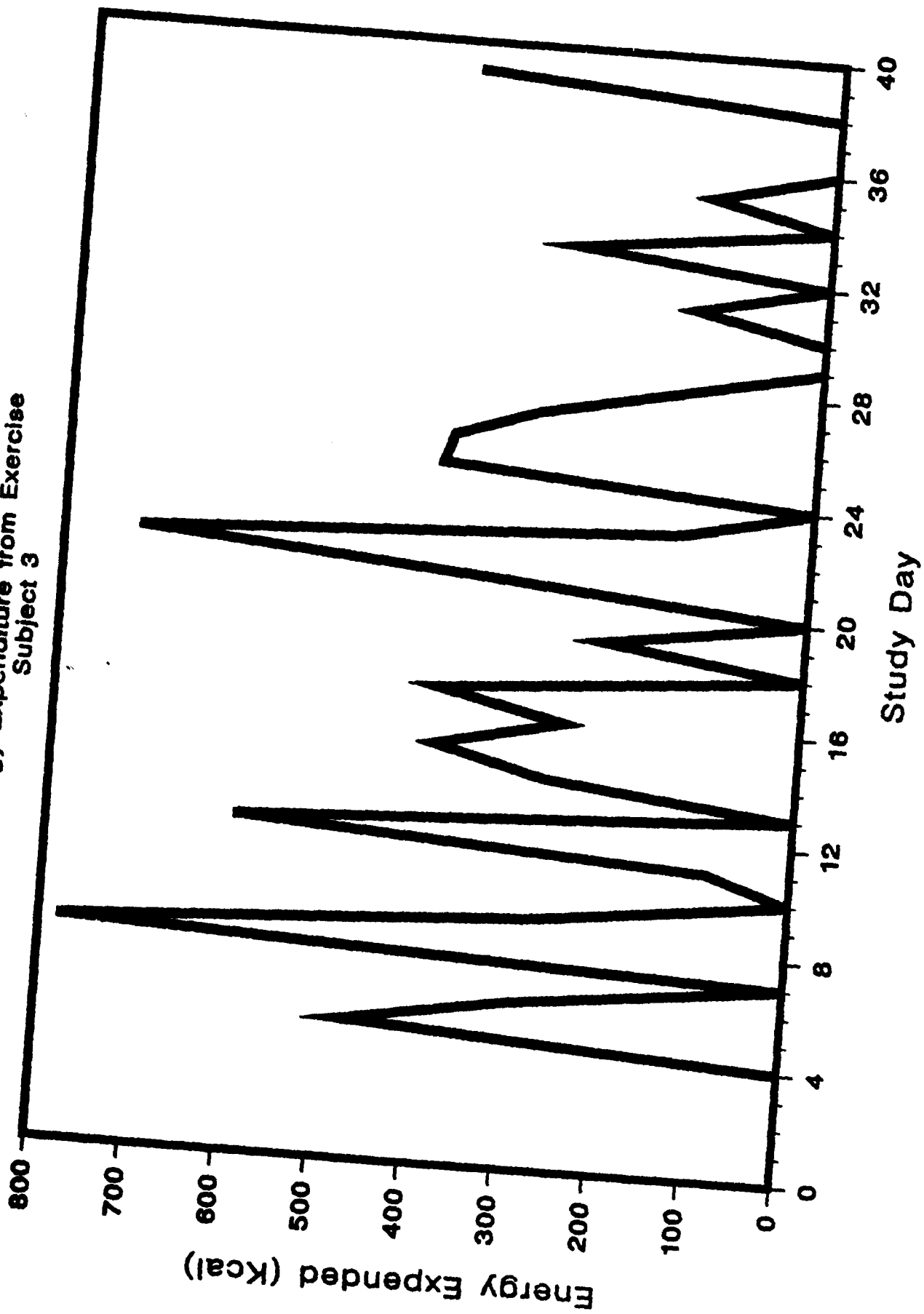


Figure 3
Operation Everest II
Energy Expenditure from Exercise
Subject 4

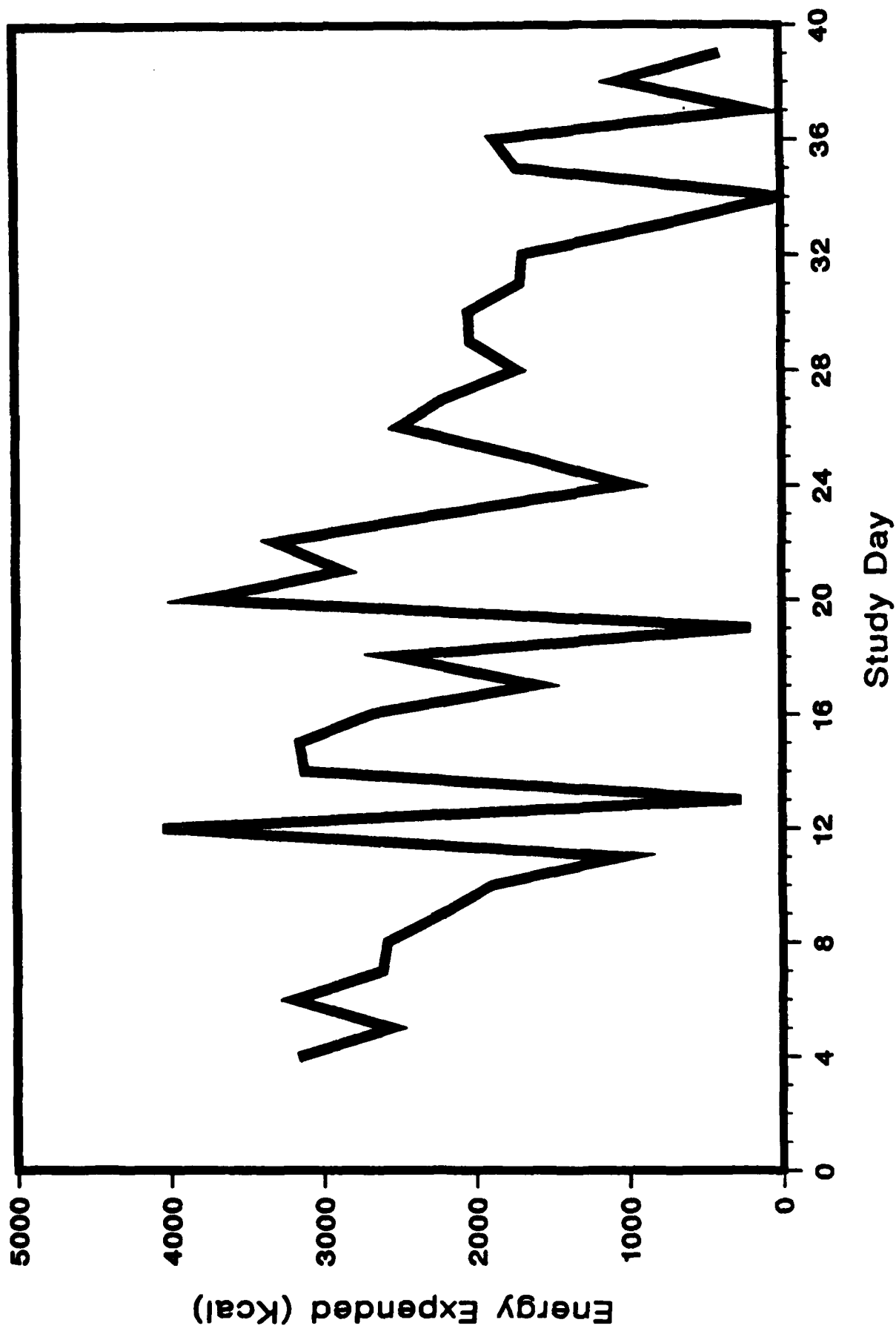


Figure 4
Operation Everest II
Energy Expenditure from Exercise
Subject 5

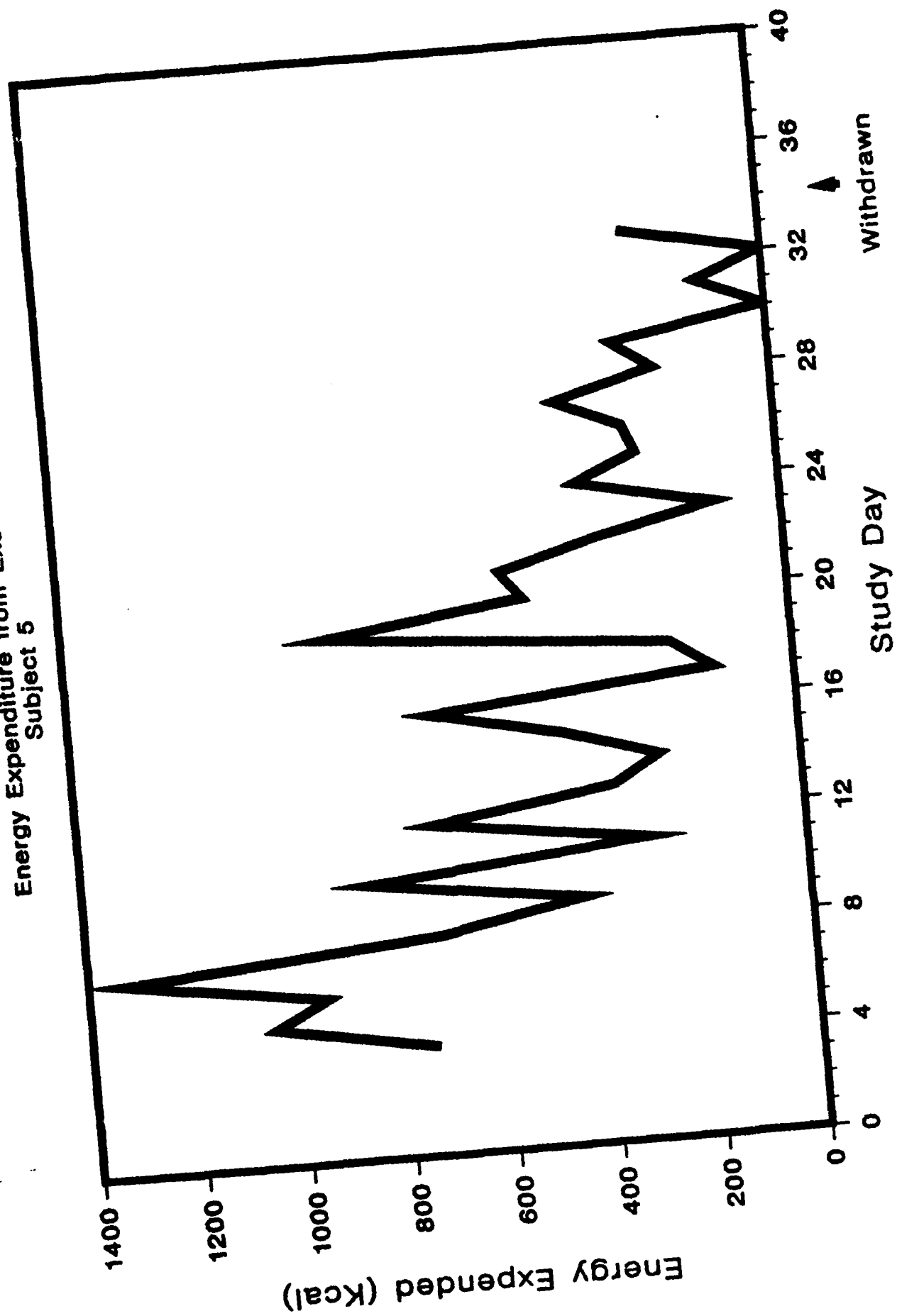


Figure 5
Operation Everest II
Energy Expenditure from Exercise
Subject 6

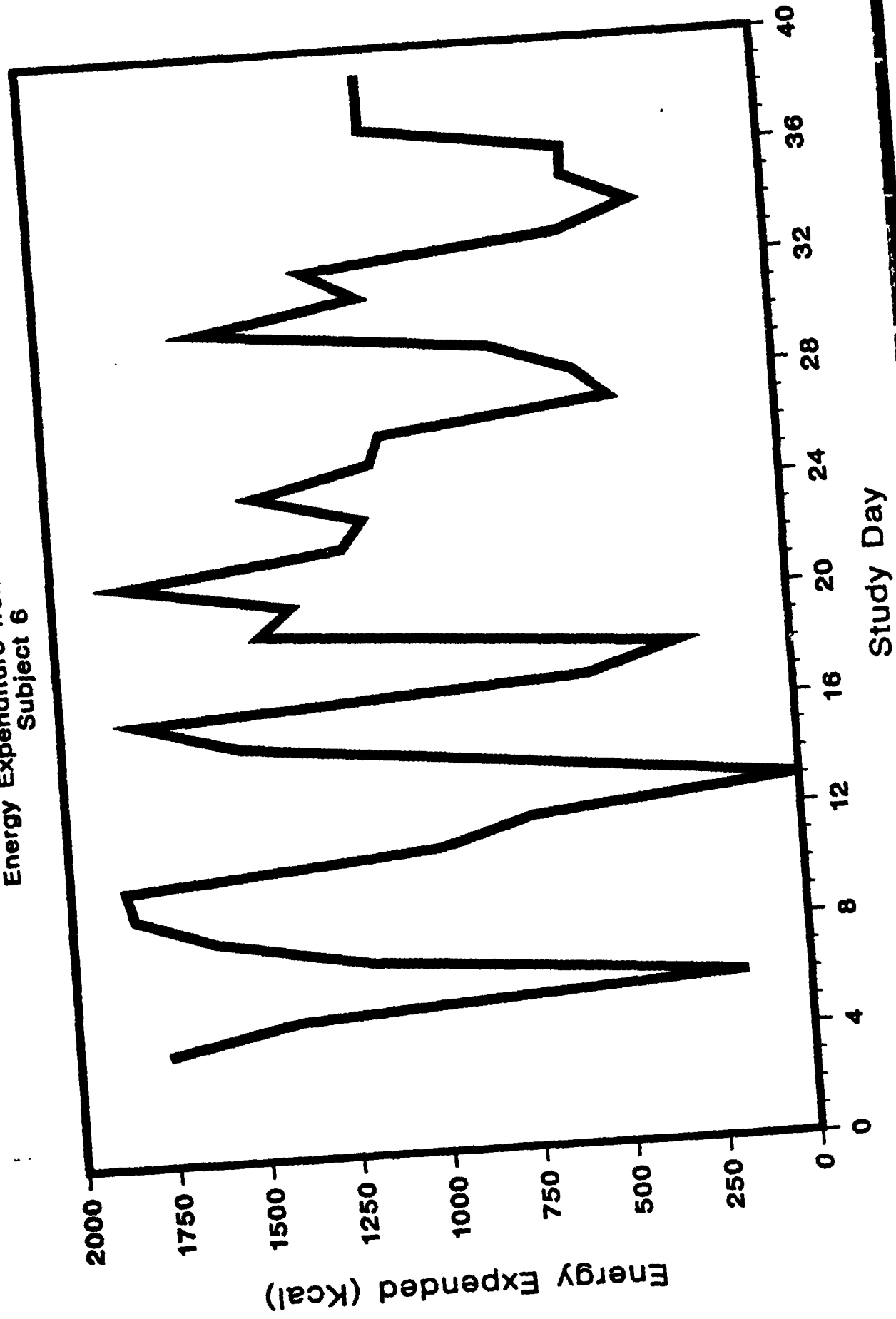


Figure 6
Operation Everest II
Energy Expenditure from Exercise
Subject 7

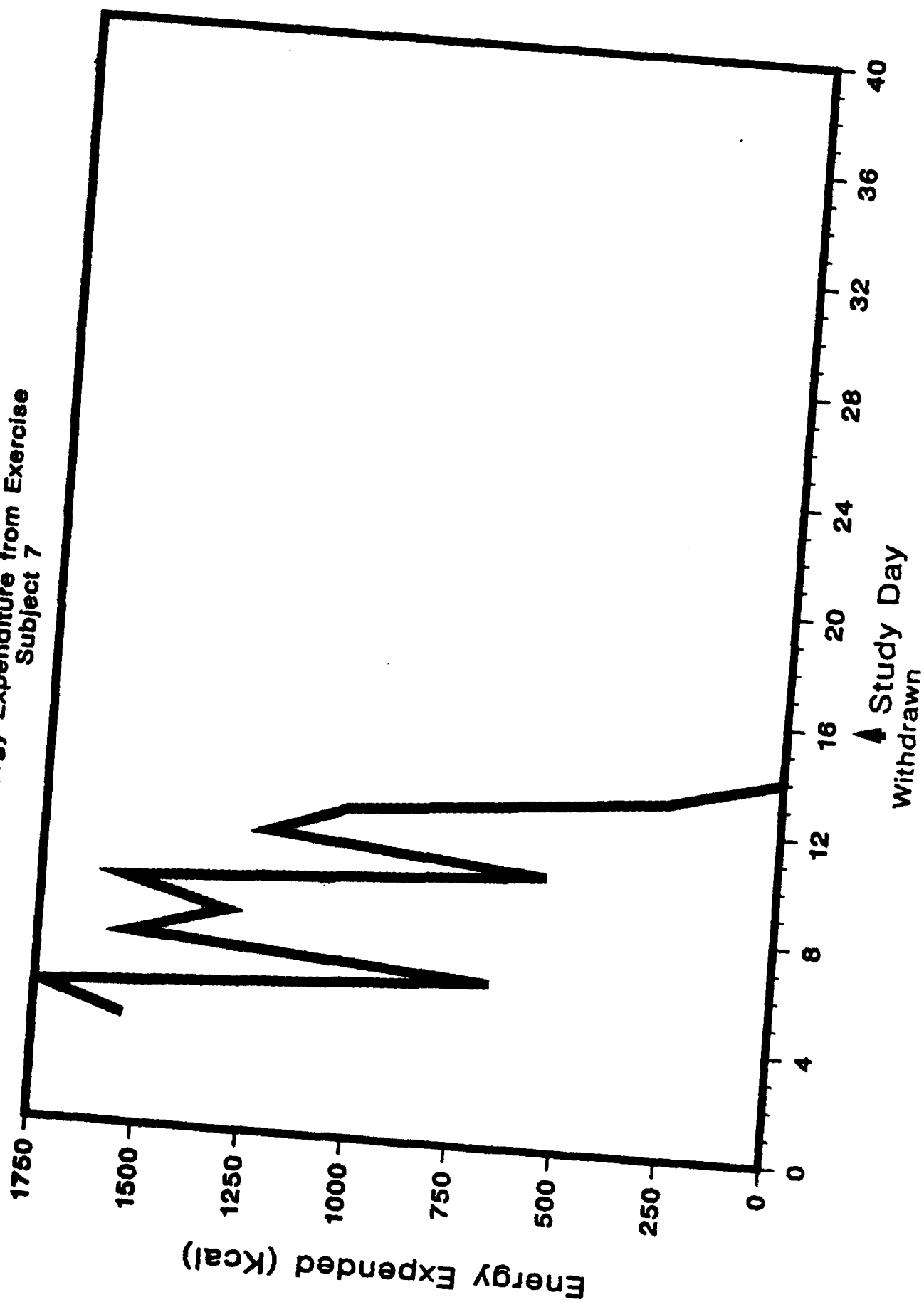


Figure 7
Operation Everest II
Energy Expenditure from Exercise
Subject 8

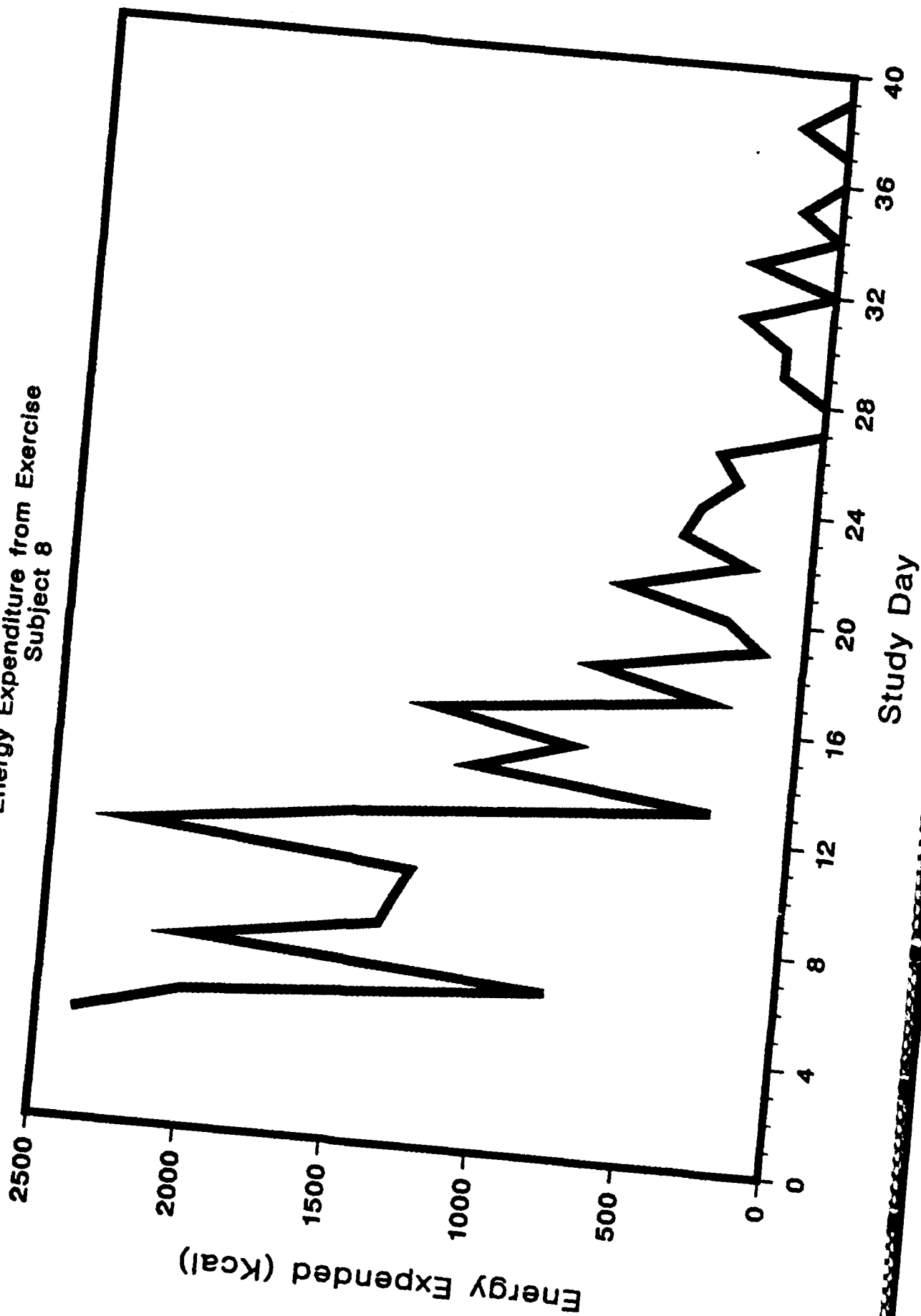


Figure 8
Operation Everest II
Energy Expenditure from Exercise
Subject 9

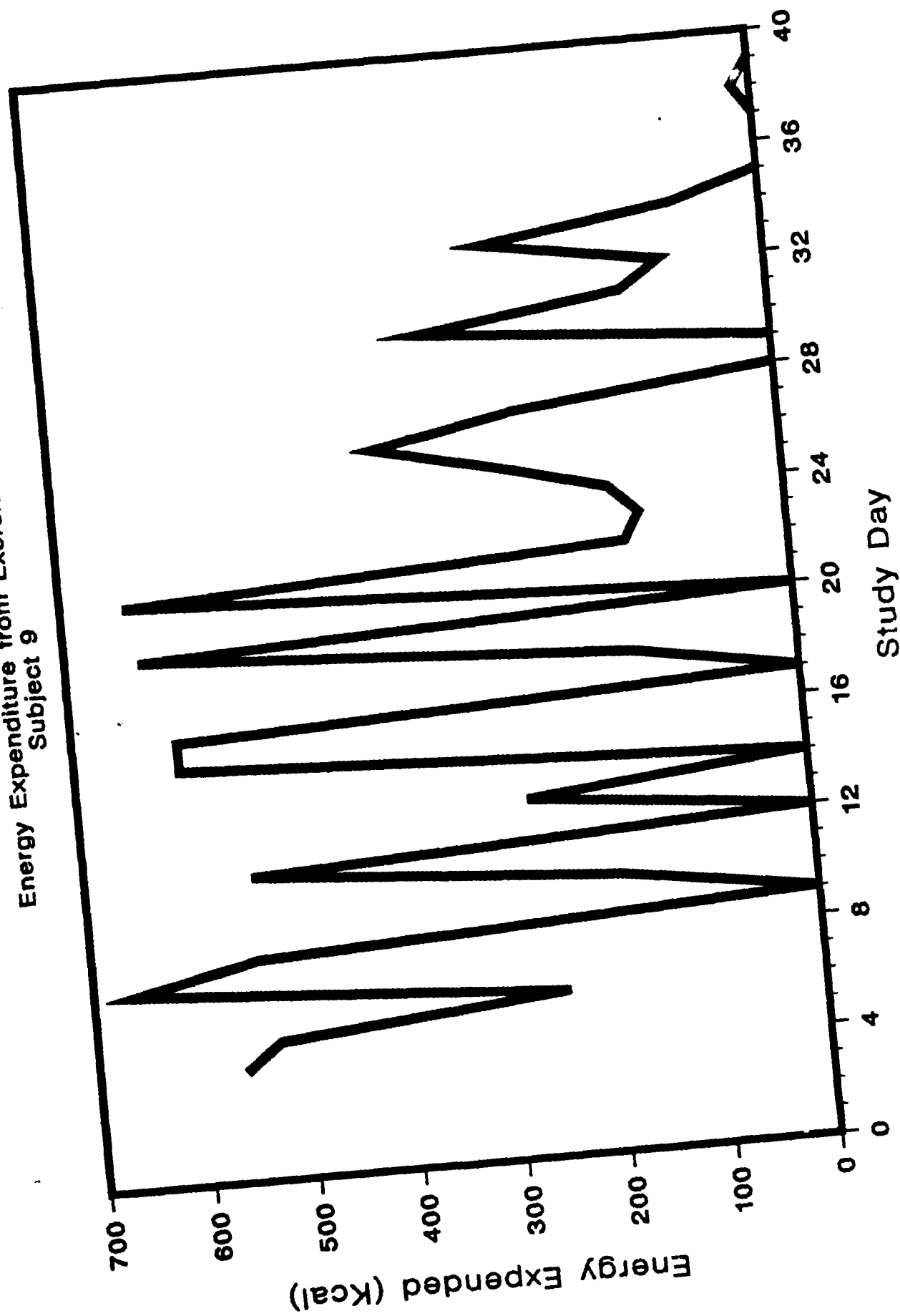


Figure 9
Operation Everest II
Duration of Exercise
Subject 1

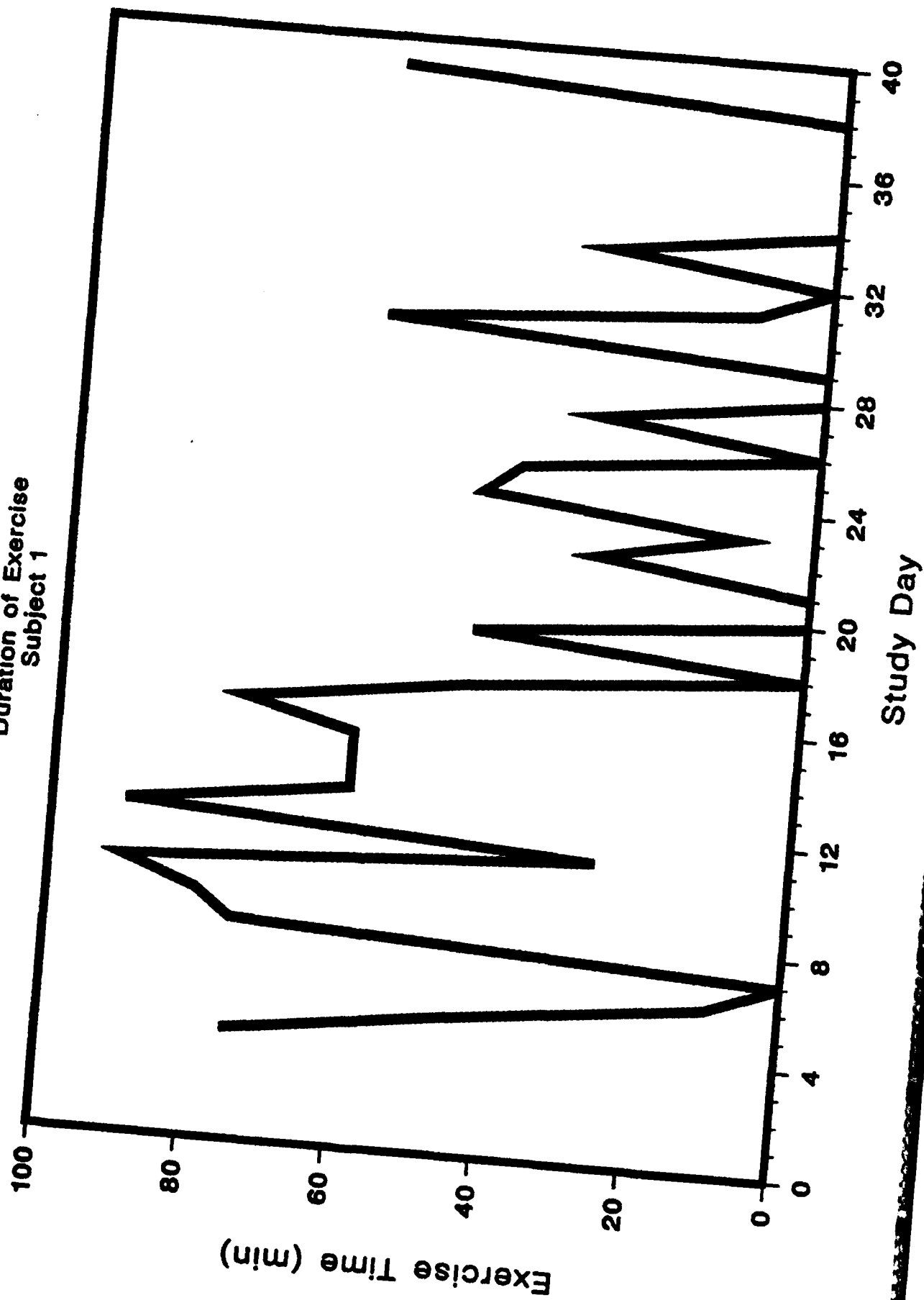


Figure 10
Operation Everest II
Duration of Exercise
Subject 3

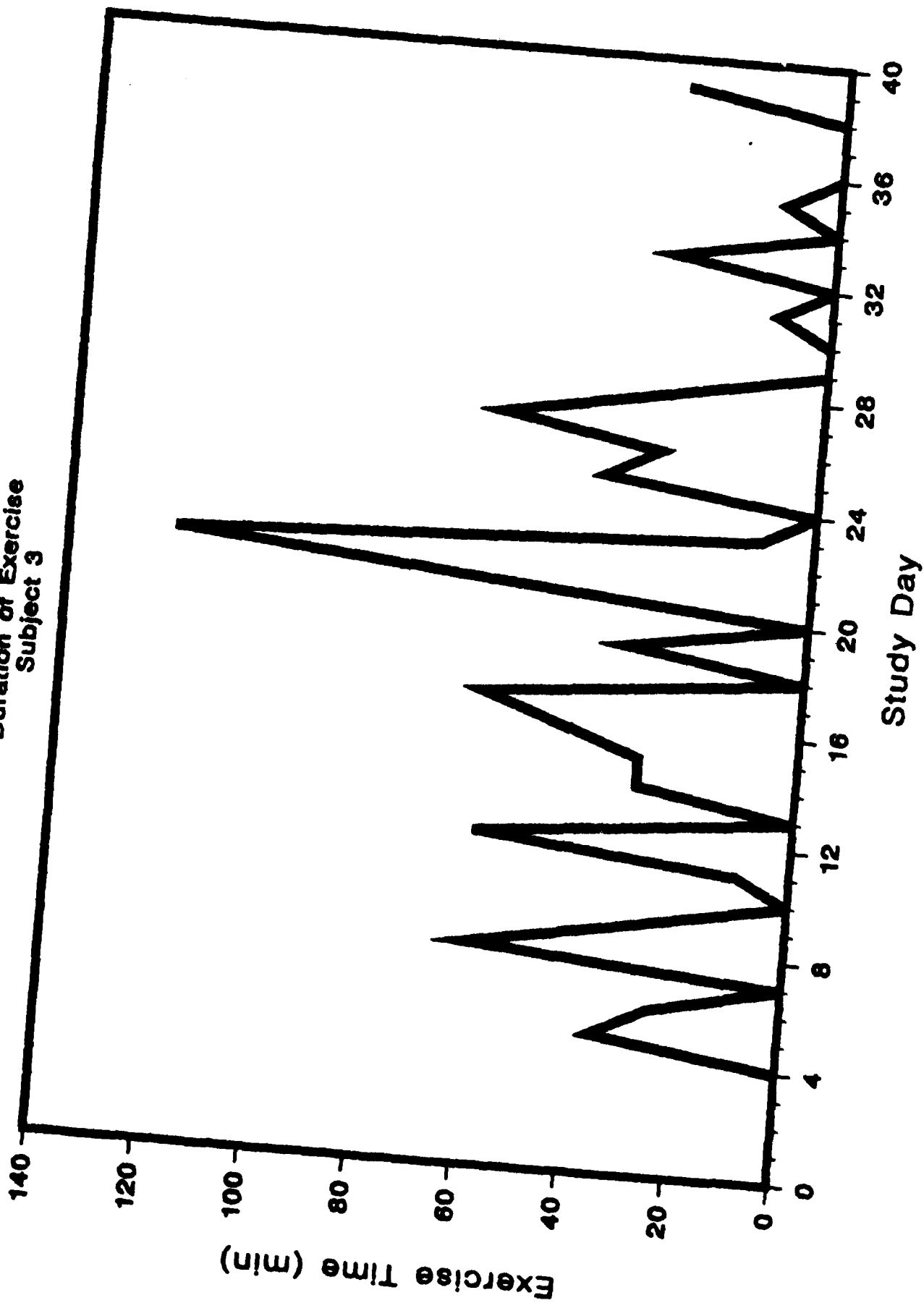


Figure 11
Operation Everest II
Duration of Exercise
Subject 4

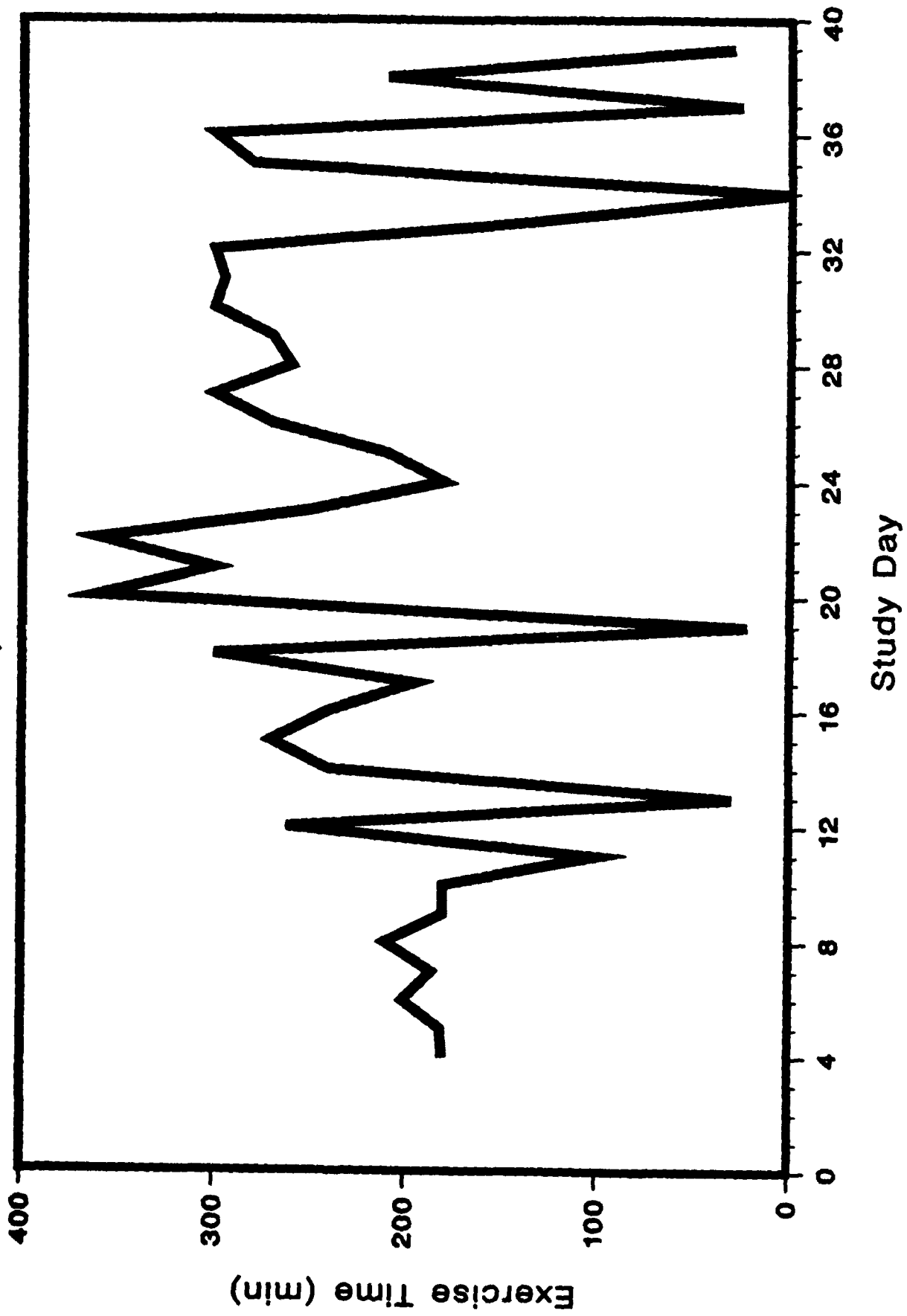


Figure 12
Operation Everest II
Duration of Exercise
Subject 5

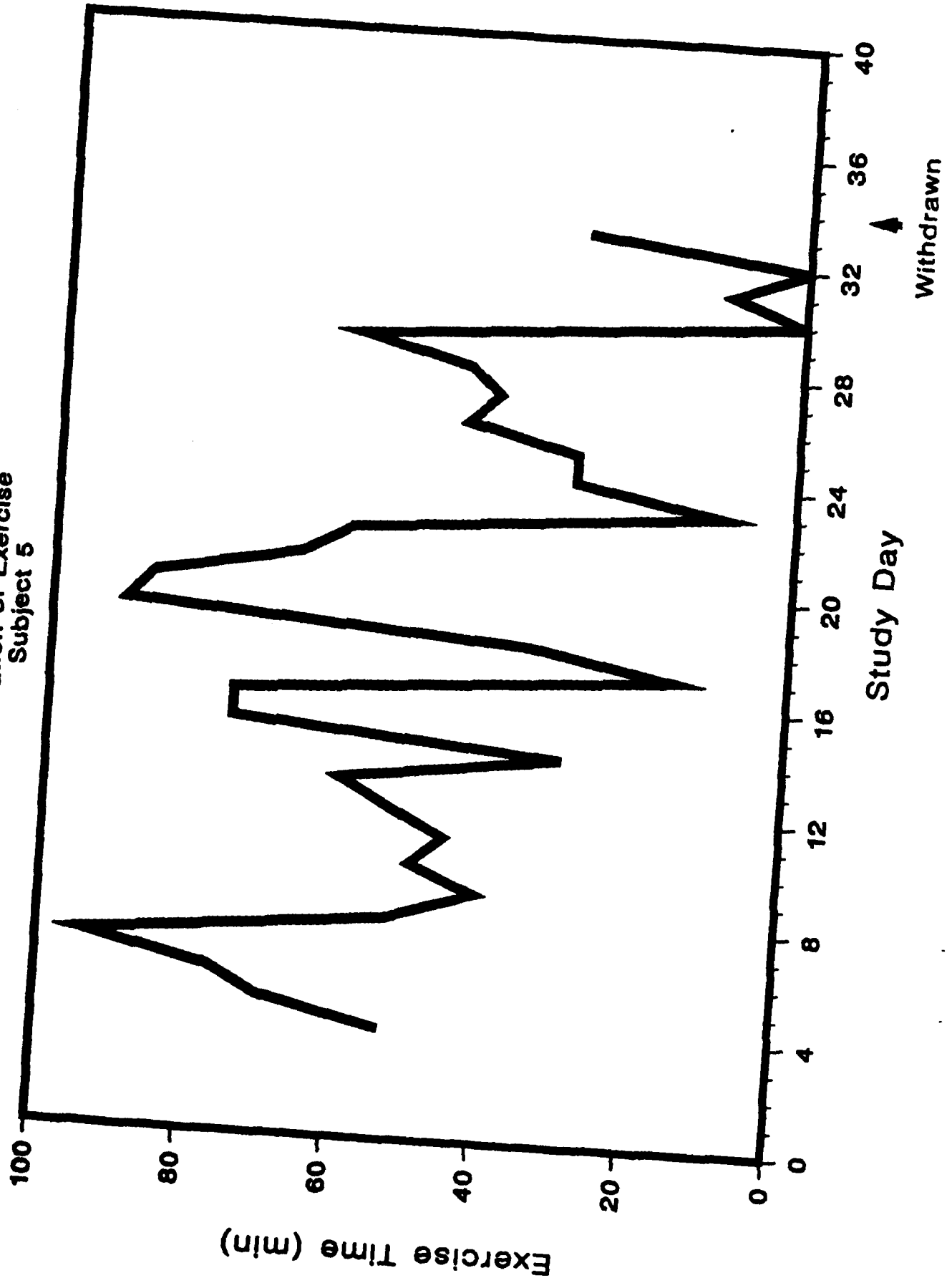


Figure 13
Operation Everest II
Duration of Exercise
Subject 6

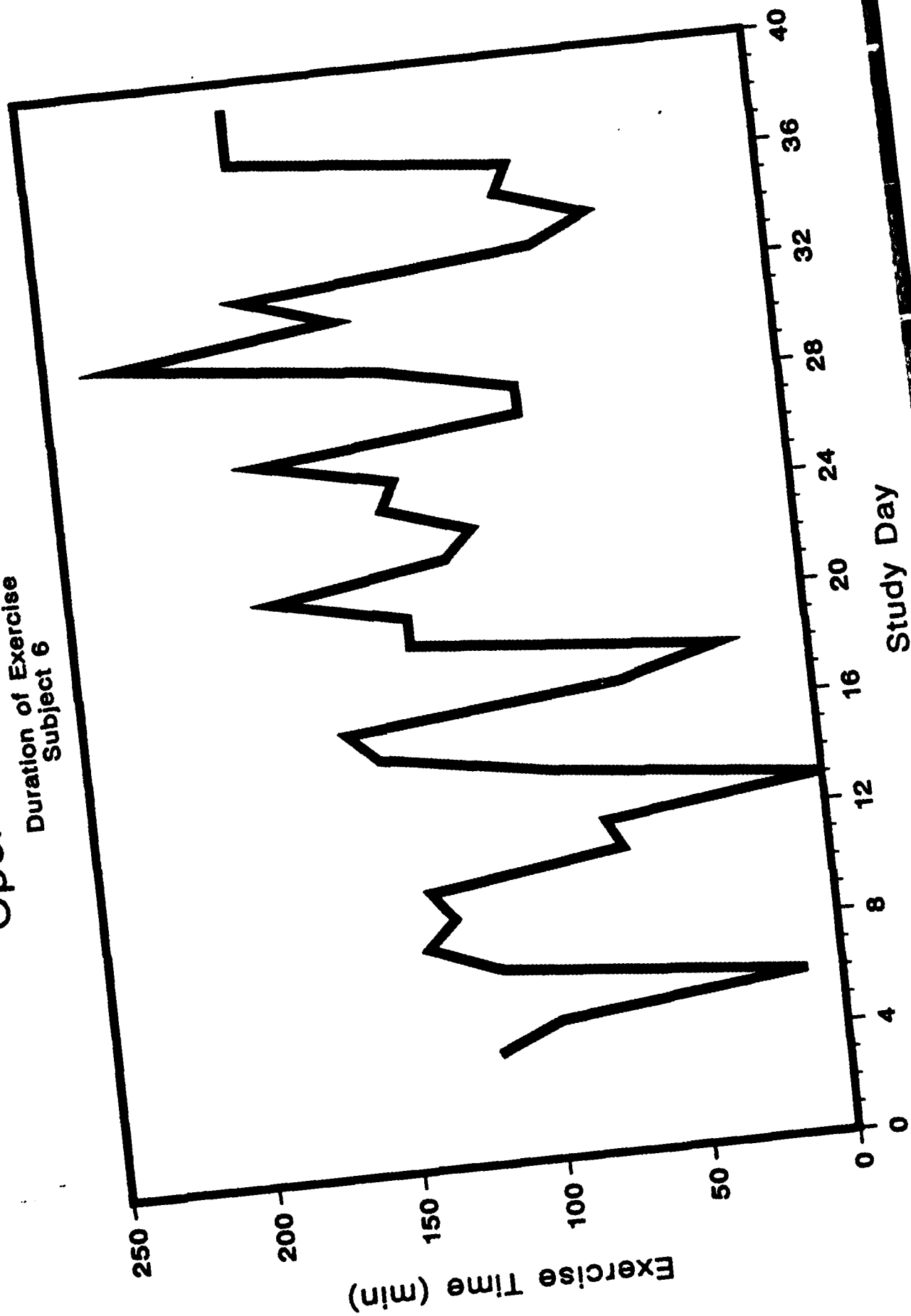


Figure 14
Operation Everest II
Duration of Exercise
Subject 7

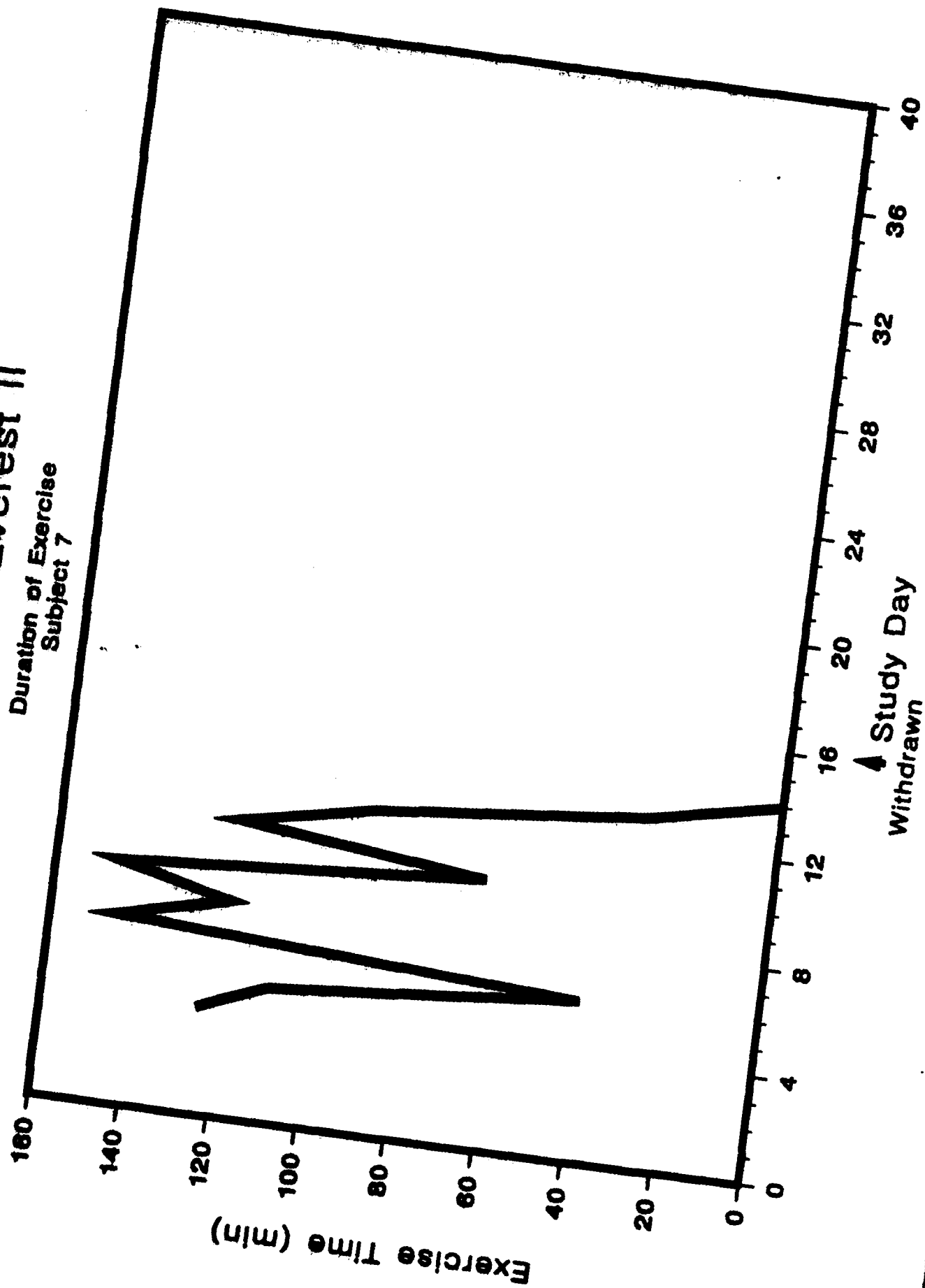


Figure 15
Operation Everest II
Duration of Exercise
Subject 8

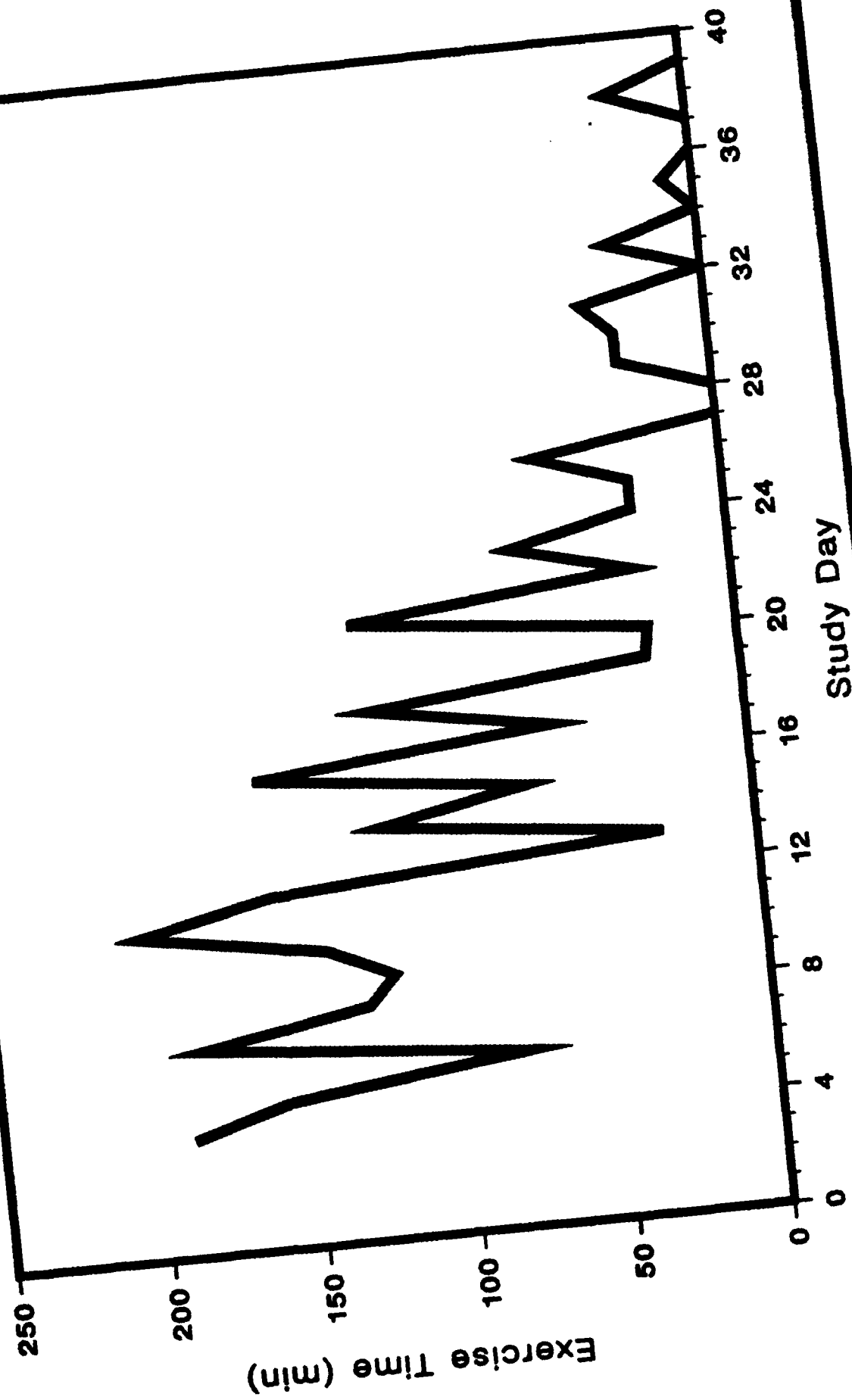


Figure 16
Operation Everest II
Duration of Exercise
Subject 9

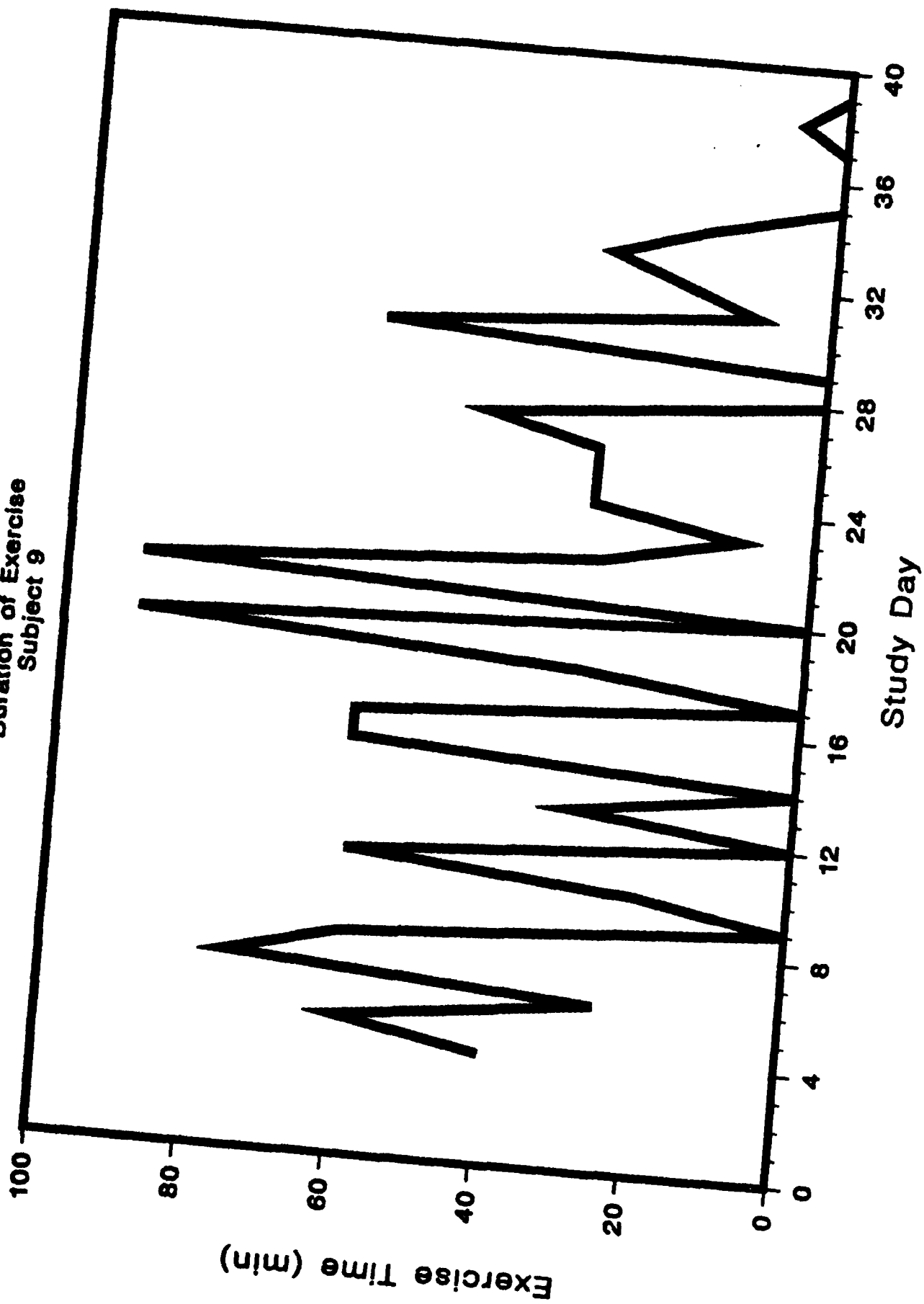


Figure 17
ENERGY and WEIGHT MEASUREMENTS
SUBJECT 1

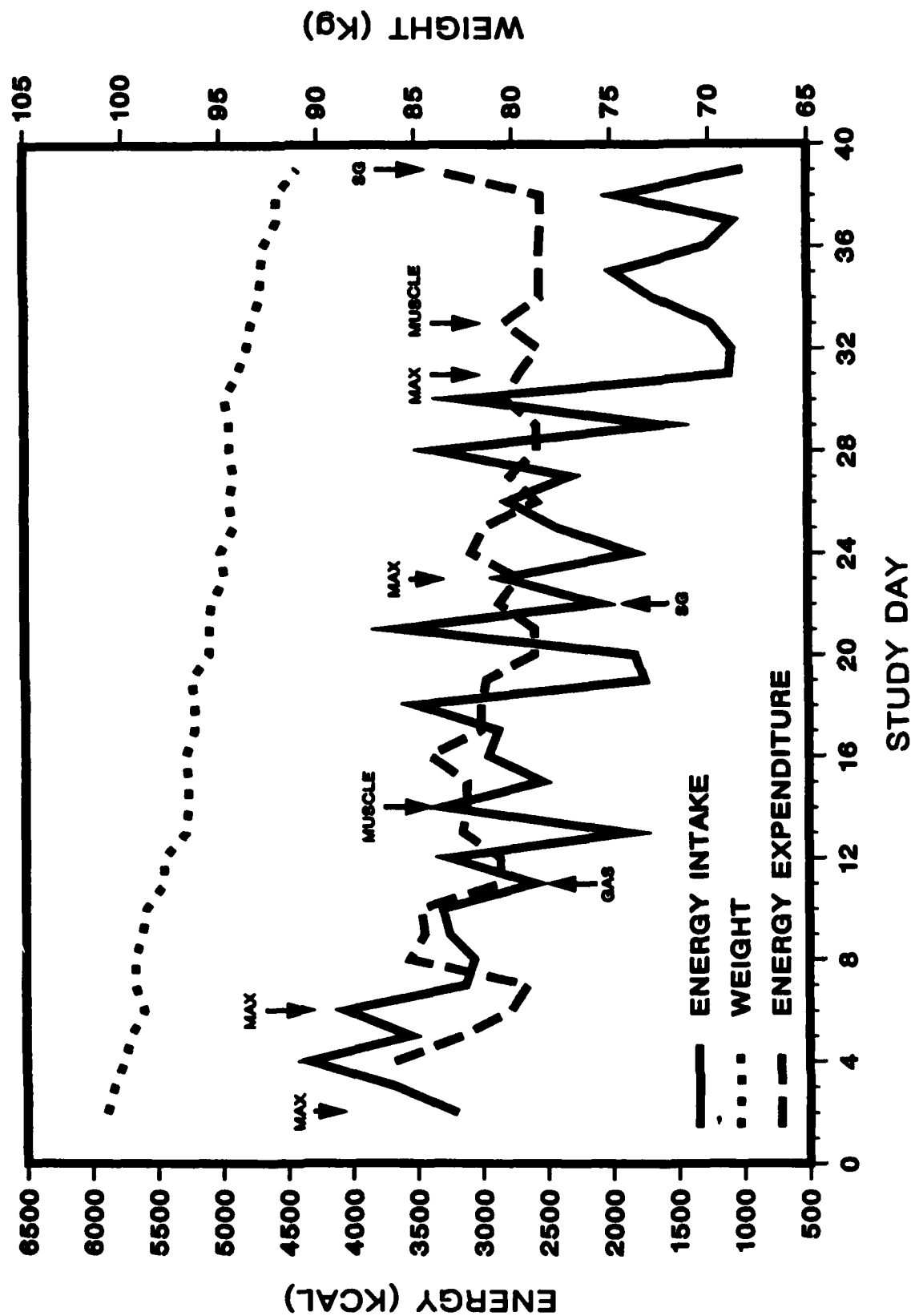


Figure 18
ENERGY and WEIGHT MEASUREMENTS
SUBJECT 3

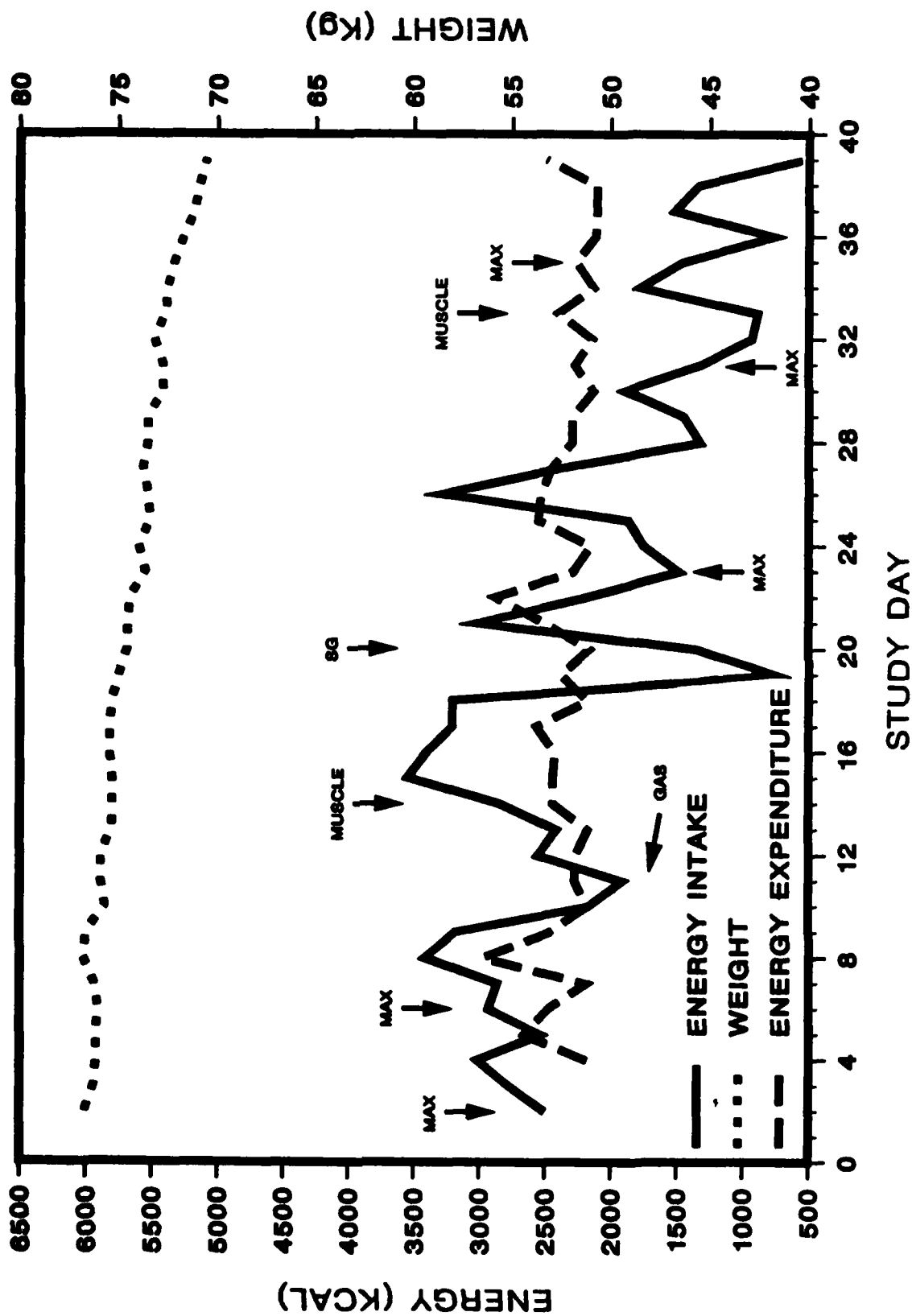


Figure 19
ENERGY and WEIGHT MEASUREMENTS

SUBJECT 4

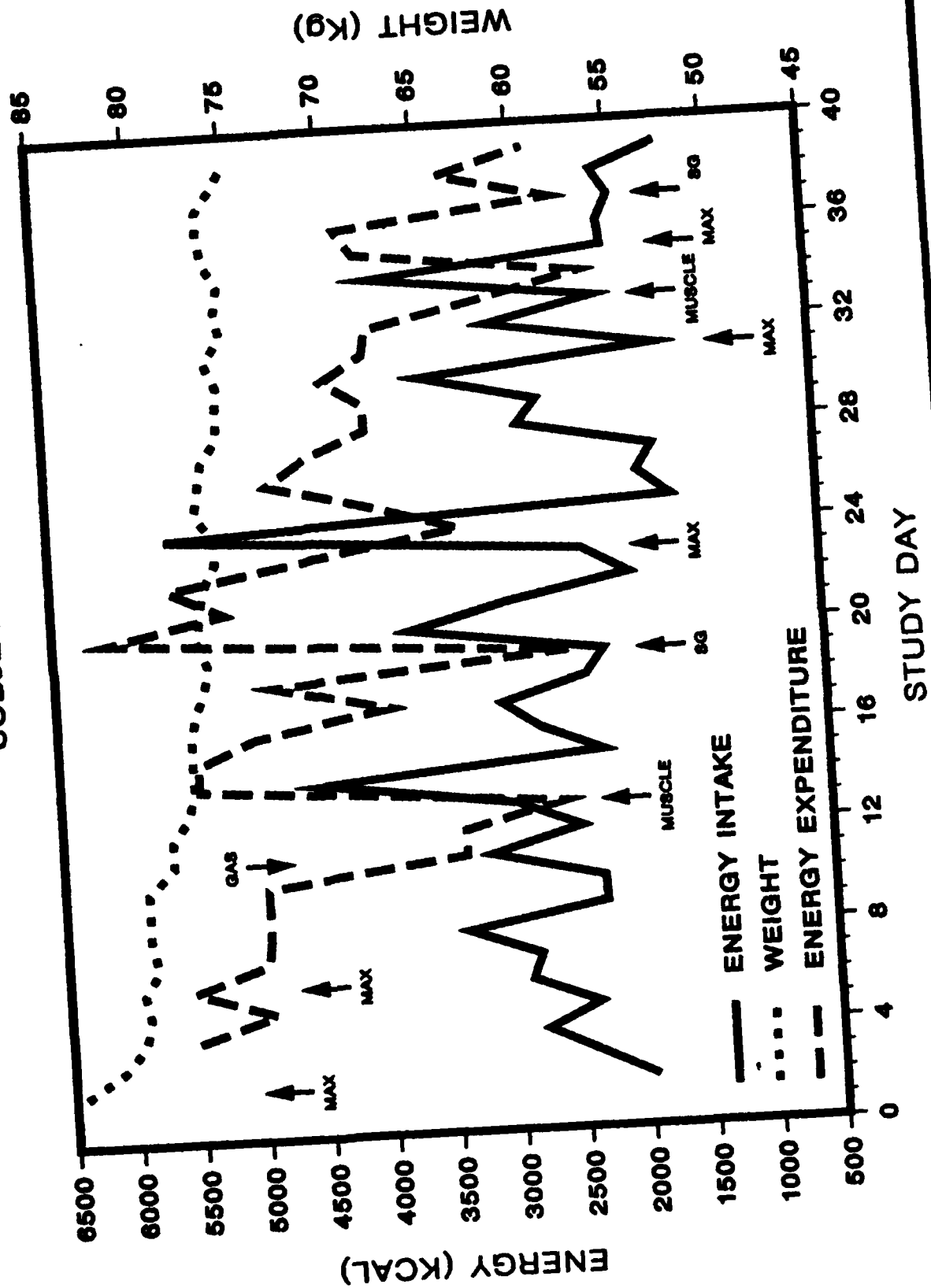


Figure 20
ENERGY and WEIGHT MEASUREMENTS
SUBJECT 5

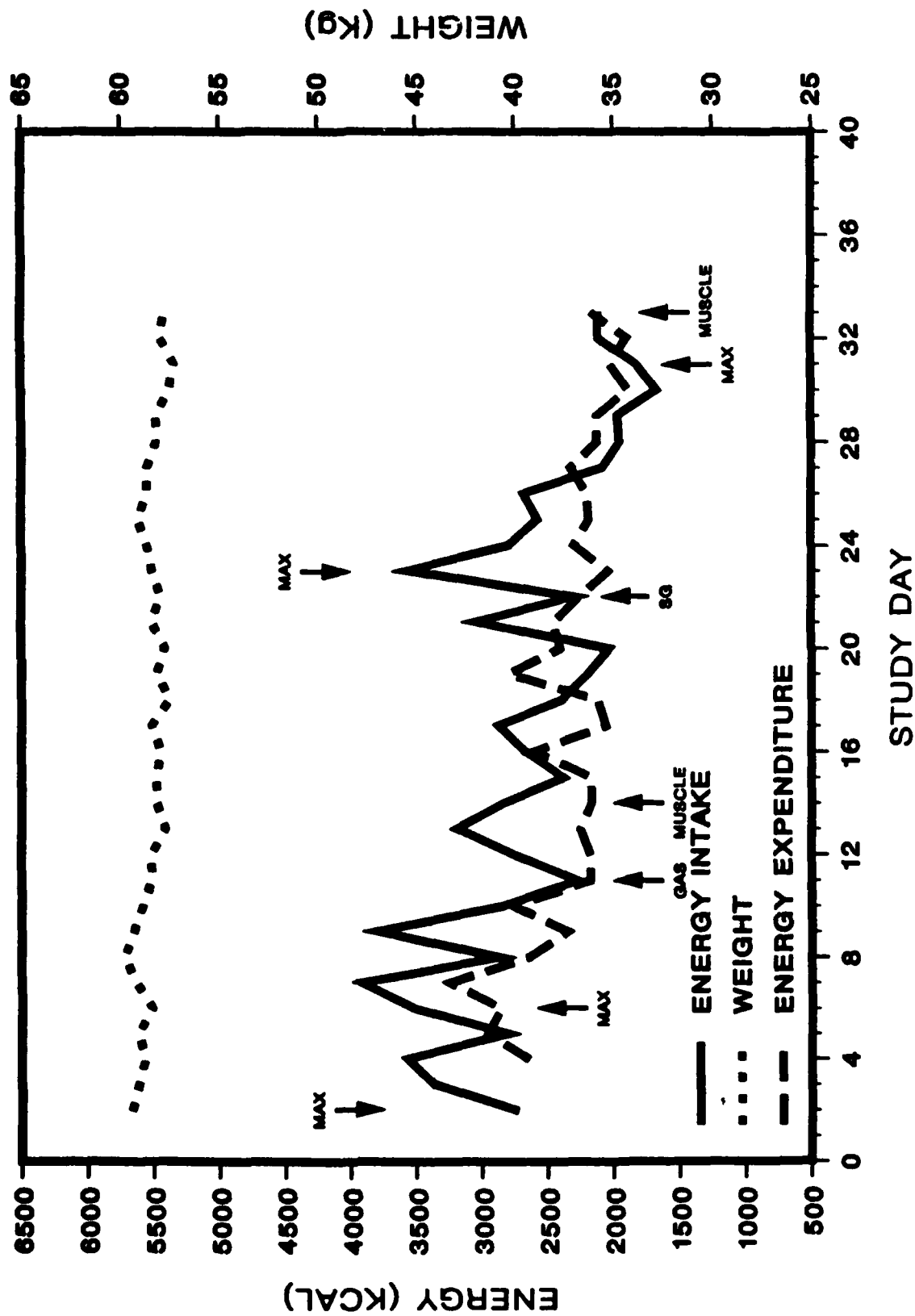


Figure 21
ENERGY and WEIGHT MEASUREMENTS
SUBJECT 6

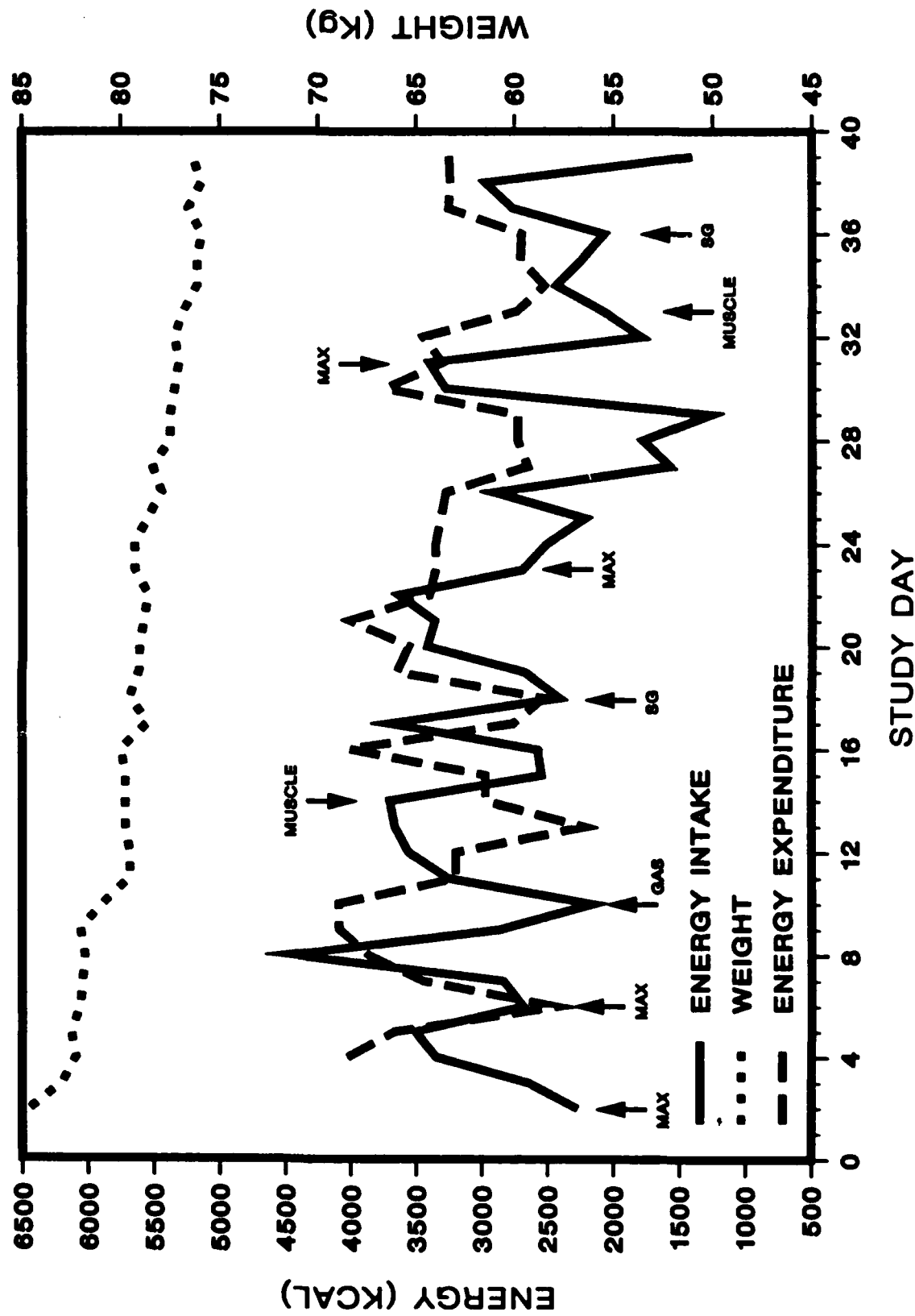


Figure 22
ENERGY and WEIGHT MEASUREMENTS
SUBJECT 7

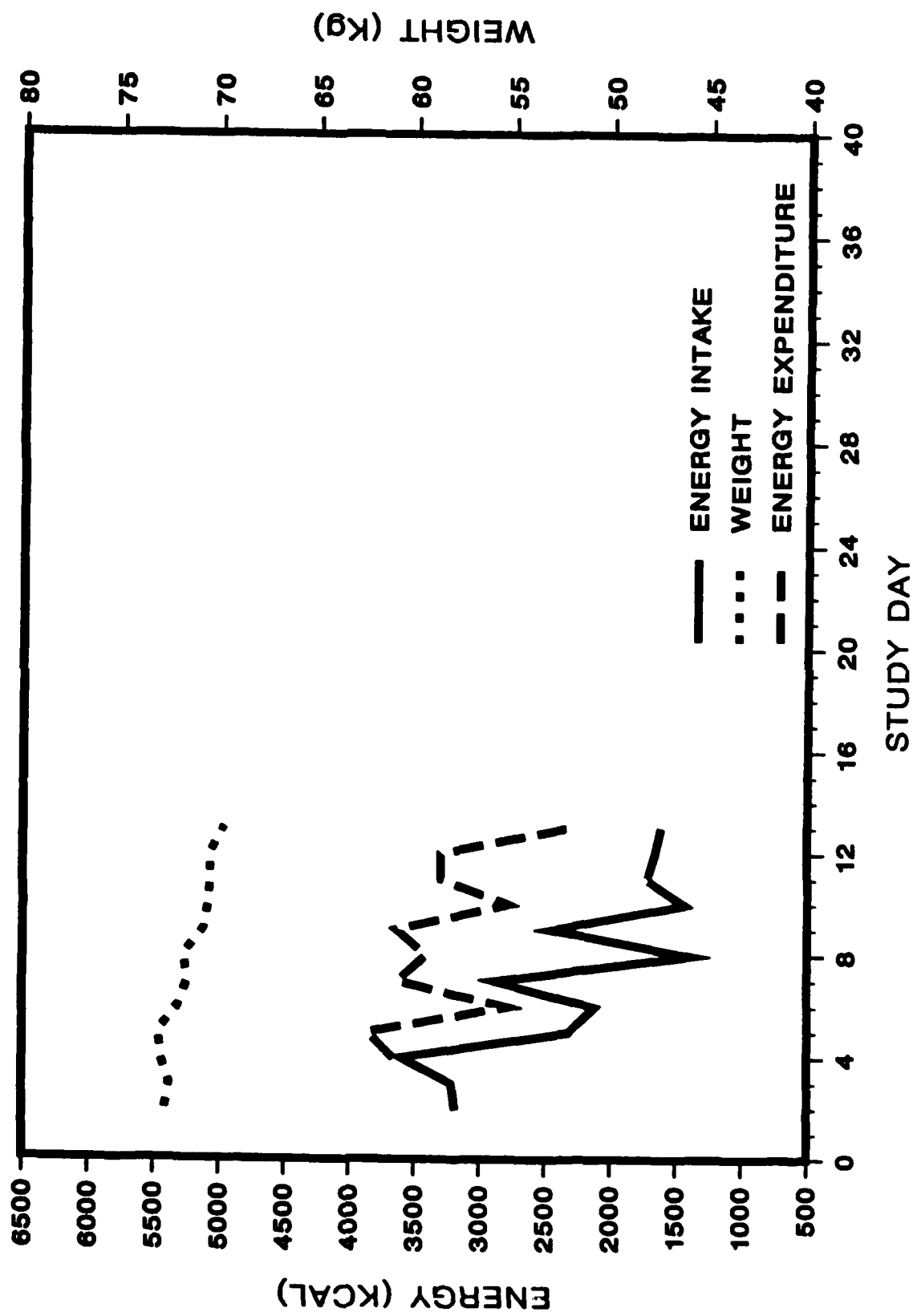


Figure 23
ENERGY and WEIGHT MEASUREMENTS
SUBJECT 8

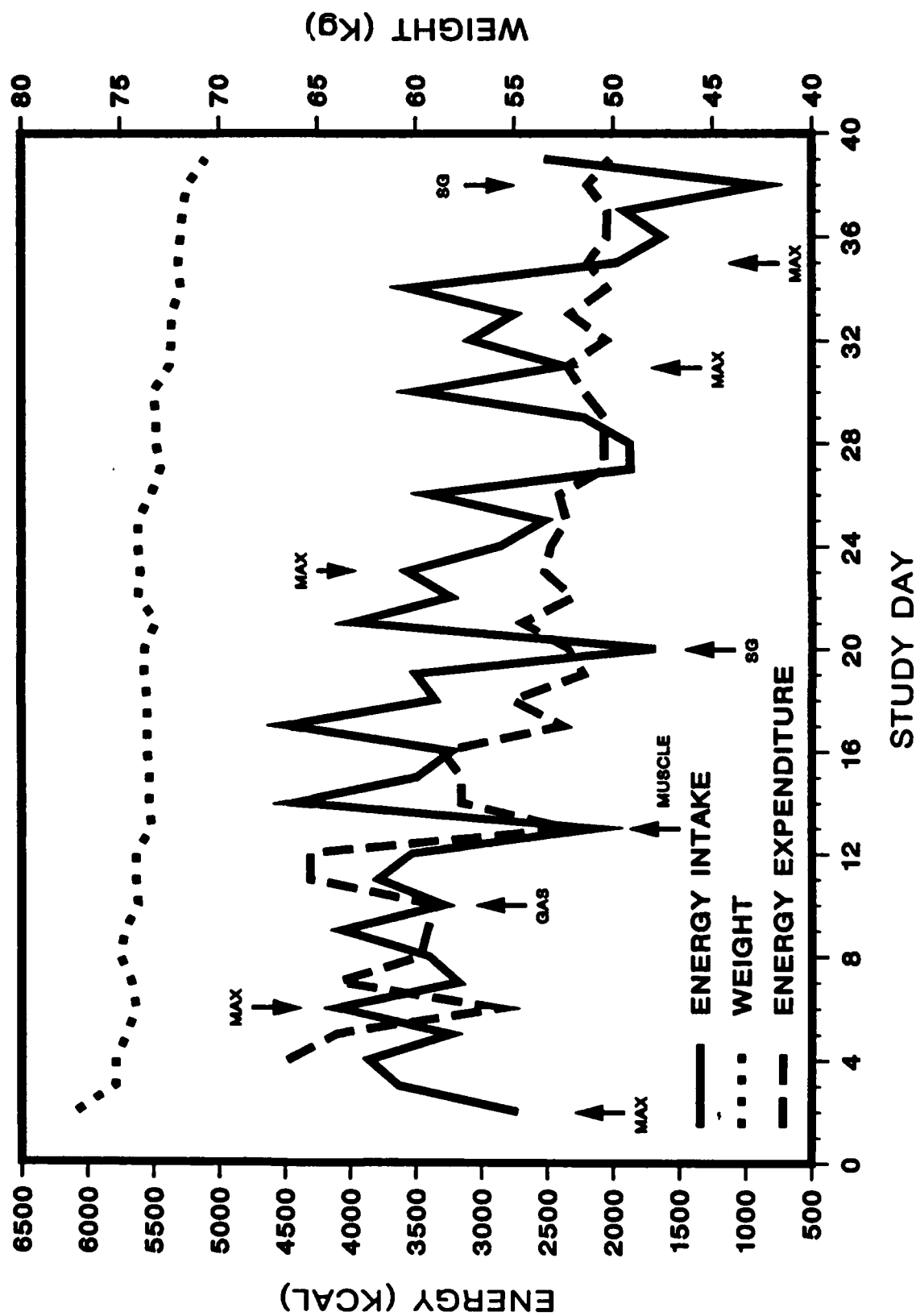


Figure 24
ENERGY and WEIGHT MEASUREMENTS

SUBJECT 9

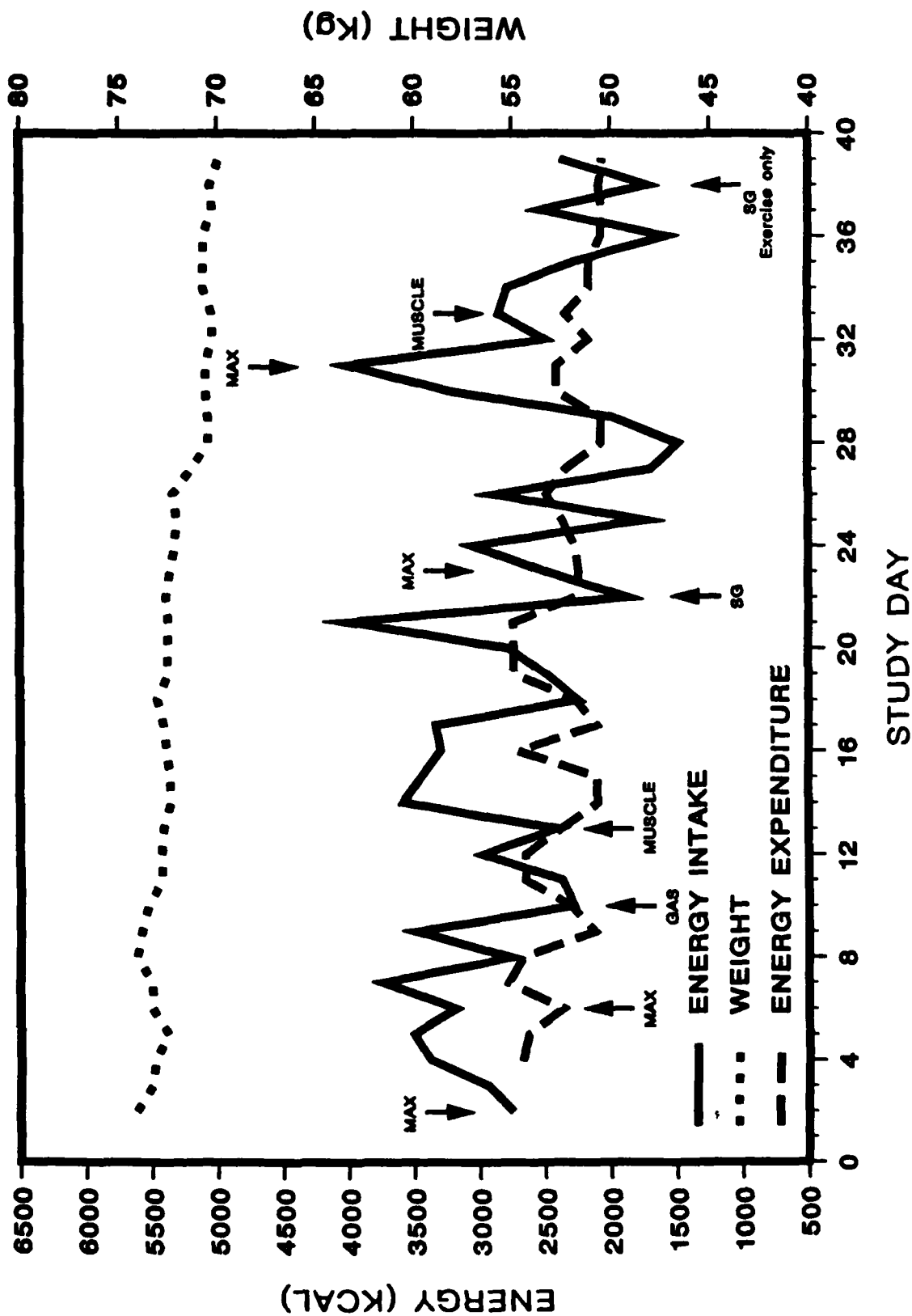


Figure 25
OPERATION EVEREST II
COMPOSITION of DIET

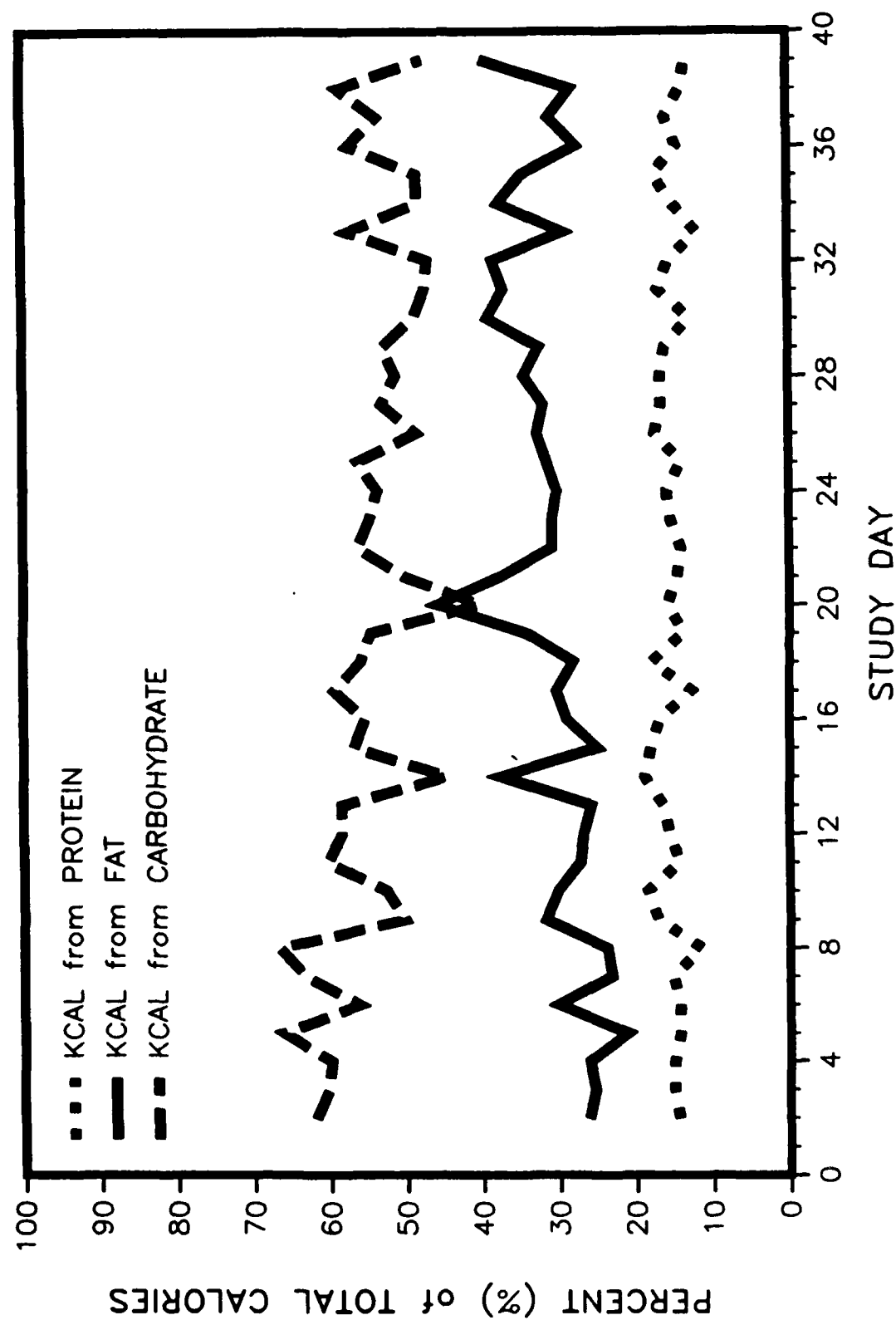


Figure 26
BODY COMPOSITION CHANGES
PERCENT BODY FAT BY HYDROSTATIC WEIGHING

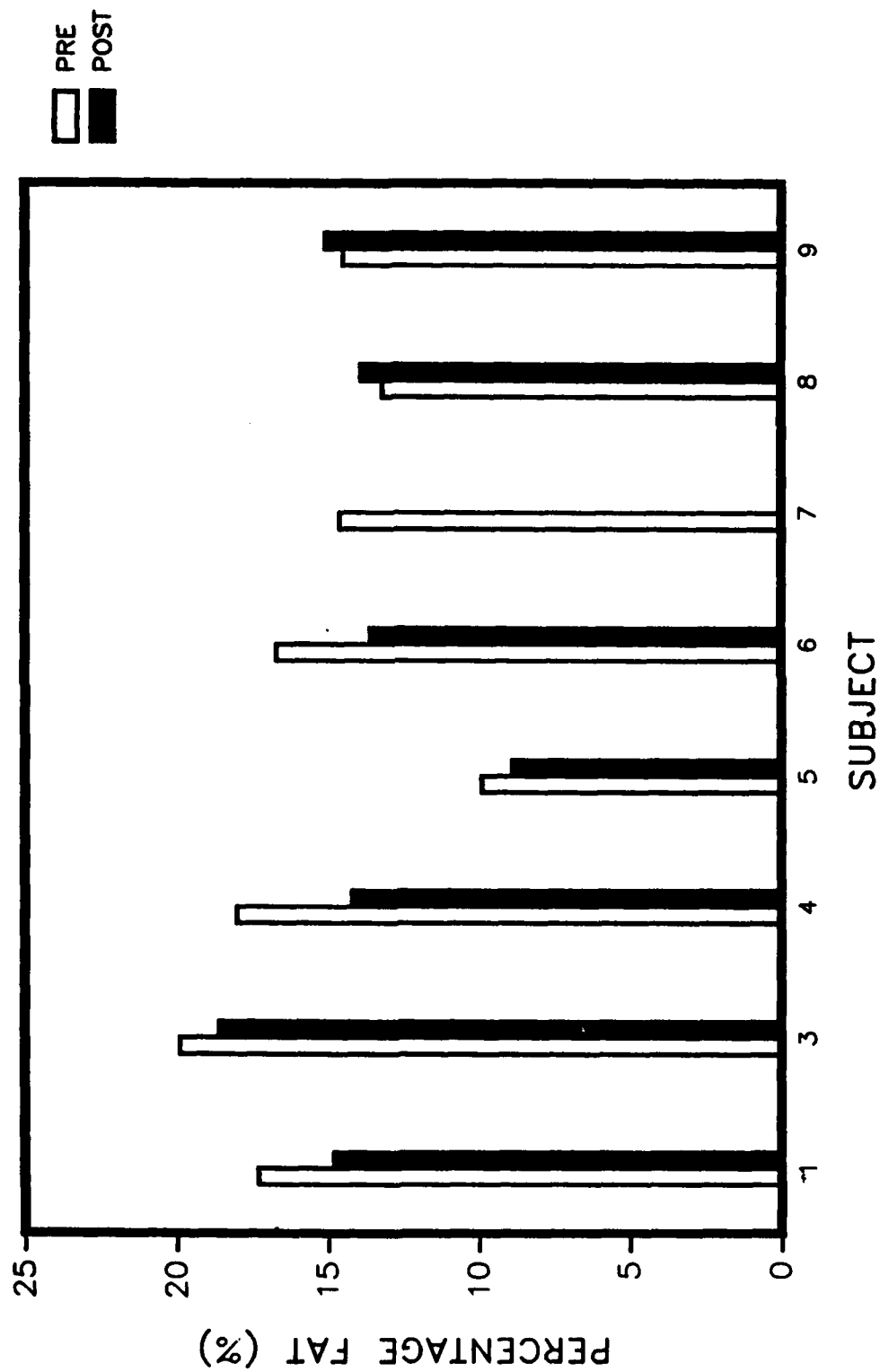


Figure 27
BODY COMPOSITION CHANGES
BODY FAT WEIGHT AS DETERMINED BY HYDROSTATIC WEIGHING

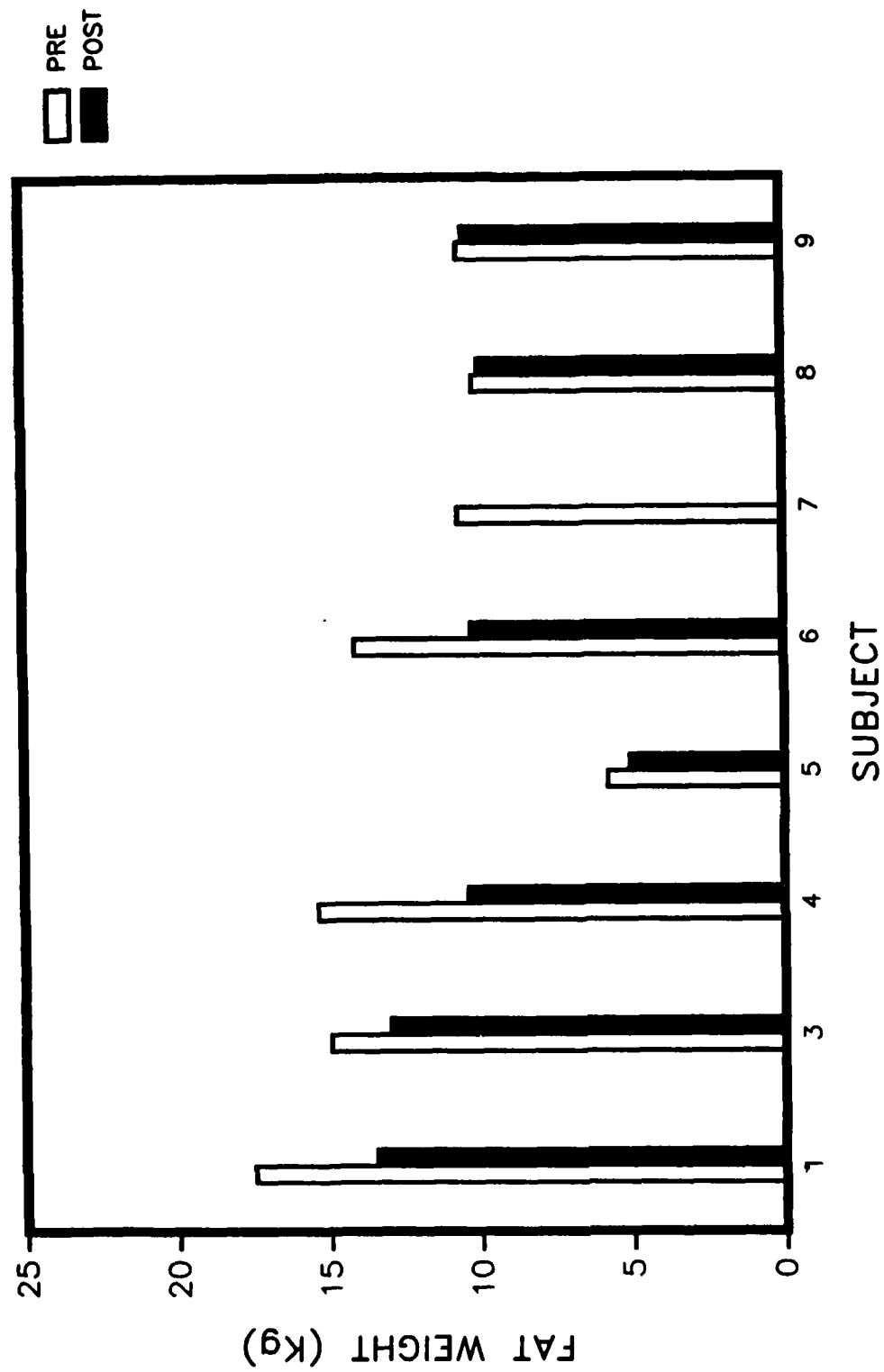


Figure 28
BODY COMPOSITION CHANGES
CIRCUMFERENCE MEASUREMENT OF ARM

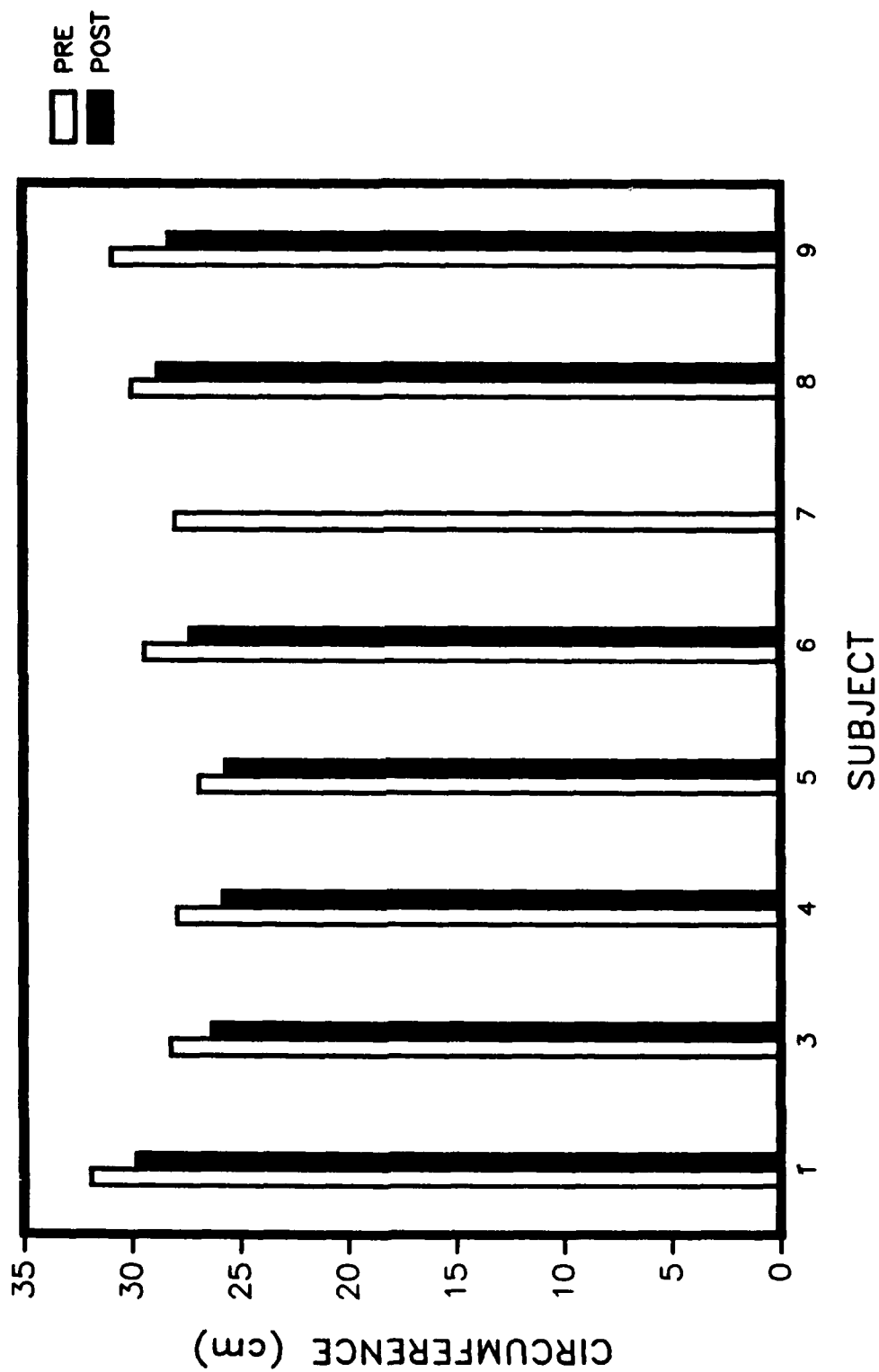


Figure 29
BODY COMPOSITION CHANGES
CIRCUMFERENCE MEASUREMENT OF THIGH

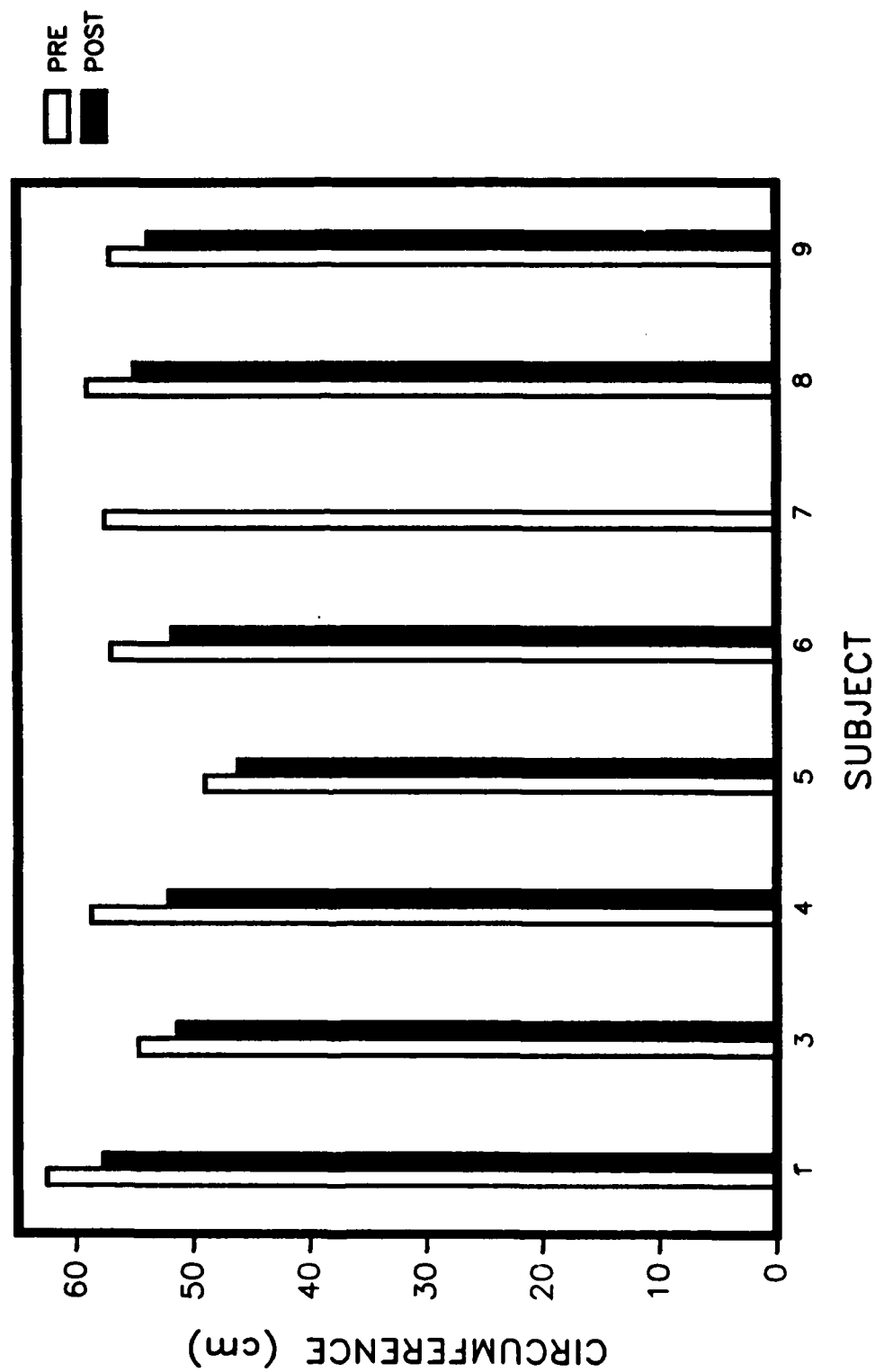


Figure 30
OPERATION EVEREST II
BODY COMPOSITION CHANGES
CT SCAN OF ARM

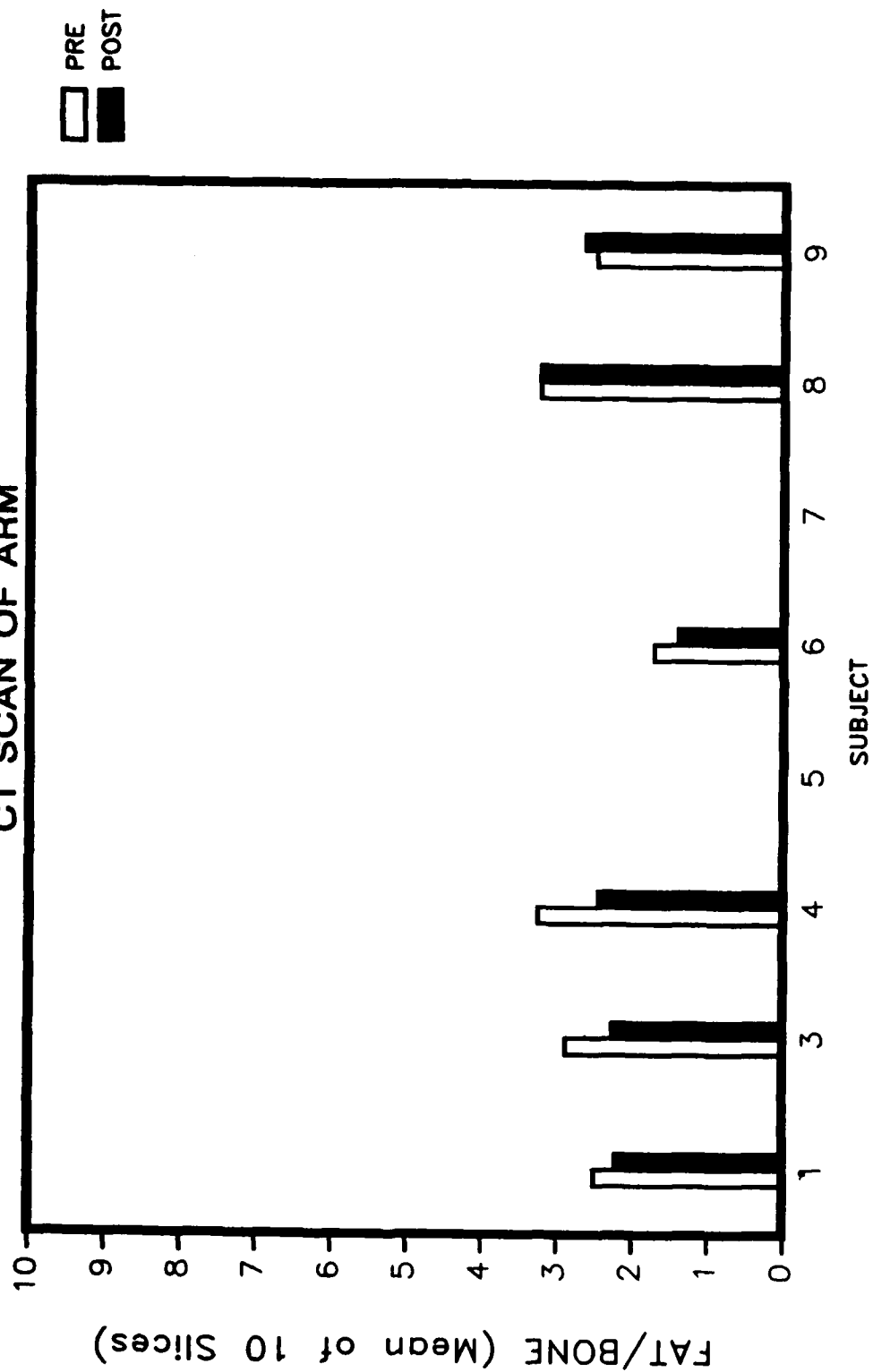


Figure 31
OPERATION EVEREST II
BODY COMPOSITION CHANGES
CT SCAN OF THIGH

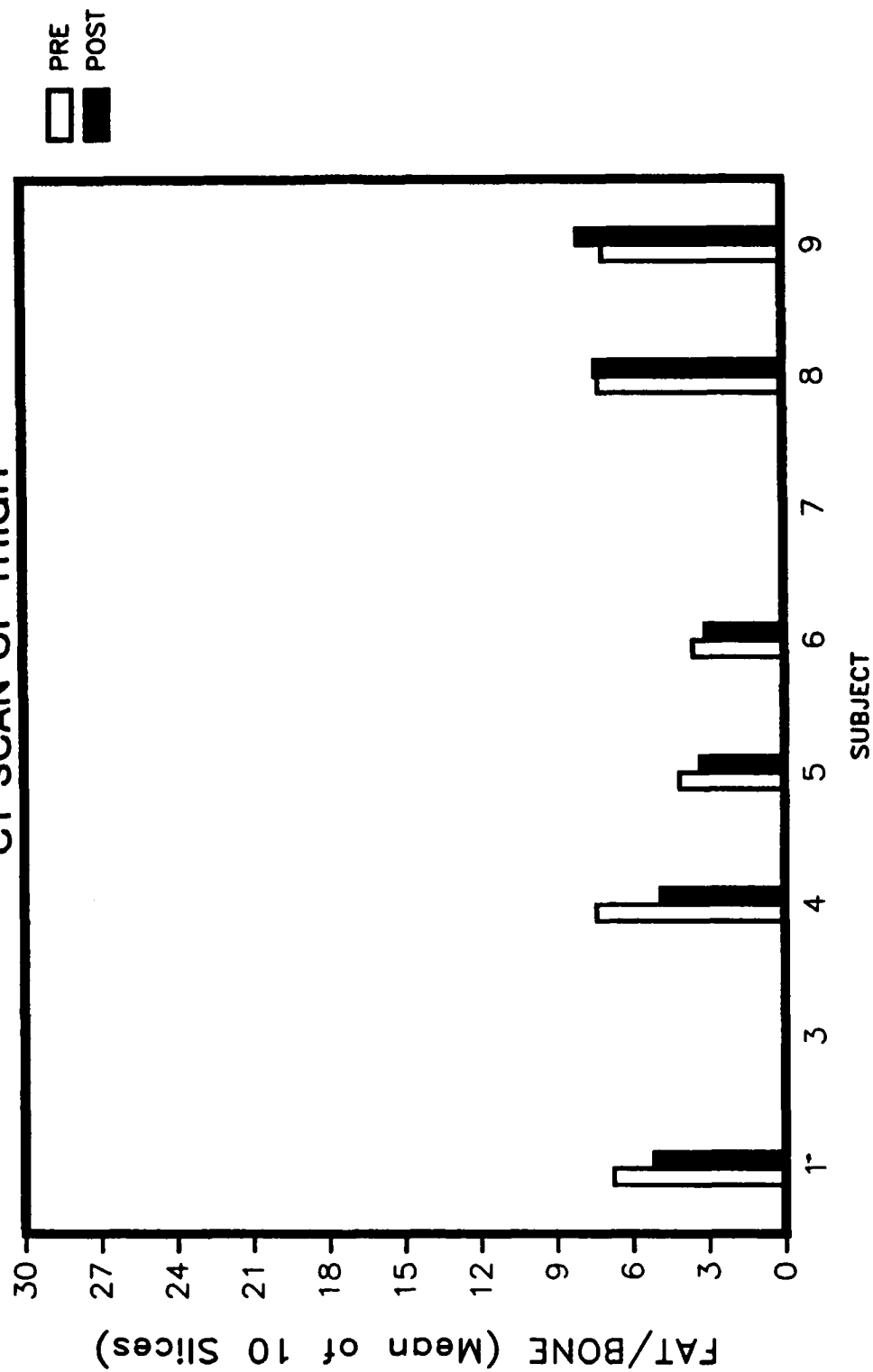


Figure 32
OPERATION EVEREST II
BODY COMPOSITION CHANGES
CT SCAN OF ARM

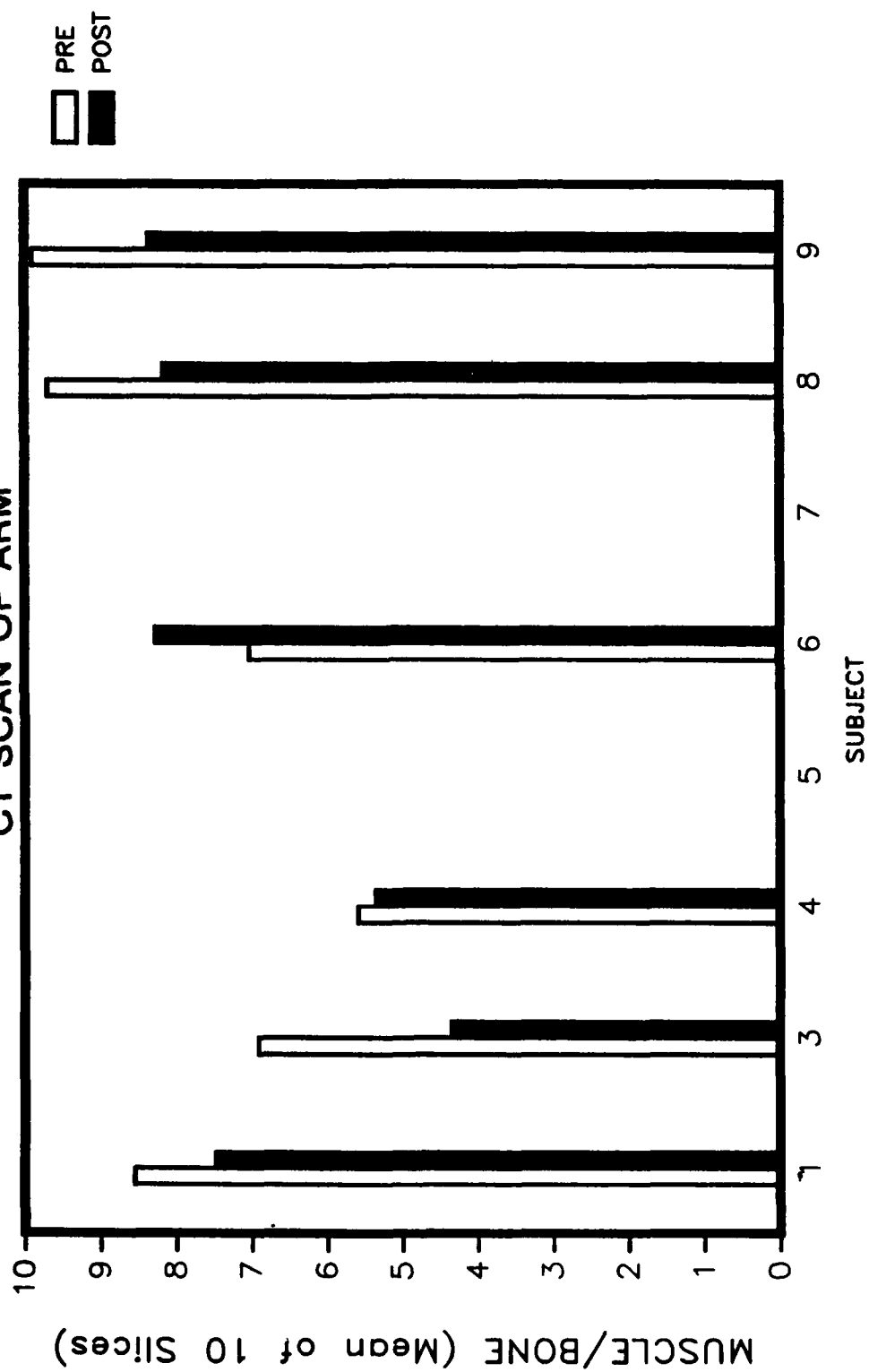
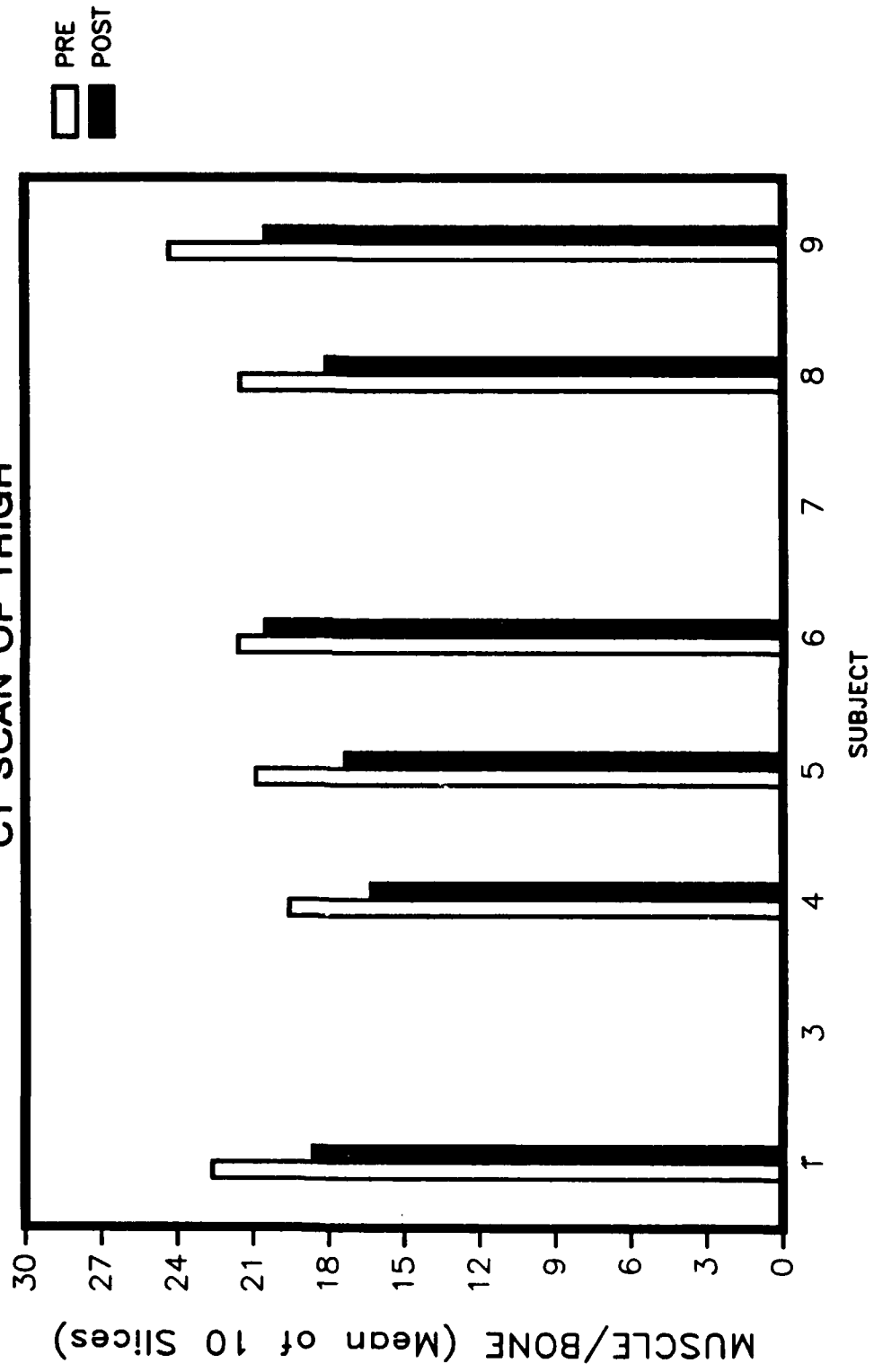


Figure 33
OPERATION EVEREST II
BODY COMPOSITION CHANGES
CT SCAN OF THIGH



APPENDICES

APPENDIX 1

Breakfast (1)

Subject Name _____

Date _____

Lunch (1)

Subject Name _____

Date _____

Amount Unit Food Item

8	oz.	Orange Juice
2	each	Hard boiled eggs
1	cup	raisin bran
1	cup	lowfat milk
2	slices	toast
1	T.	Margarine
1	T.	Jelly
2	pkg	sugar
8	oz	coffee
8	oz	hot tea

Amount Unit Food Item

4	slices	whole wheat bread
3	oz.	Roast Beef Lean
2	leaves	lettuce
2	T.	mayonnaise
1	cup	Potato Sld
1	each	Fresh banana
1	pkg	sugar
8	oz	coffee
8	oz	hot tea

Dinner (1)

Subject Name _____

Date _____

Snack (1)

Subject Name _____

Date _____

Amount	Unit	Food Item
10 1/2	oz	Spaghetti w/meatsauce
1/2	cup	corn
1	cup	tossed salad
1	T.	Italian Dressing
2	slices	french bread
1	T.	margarine
1	serving	Chocolate Cake
1	pkg	sugar
8	oz	coffee
8	oz	hot tea

Amount	Unit	Food Item
1	cup	lowfat yogurt w/fruit

Breakfast (2)

Subject Name _____

Date _____

Amount	Unit	Food Item
8	oz	Orange Juice
1	each	Banana
1	cup	oatmeal
1	cup	milk, lowfat
1	each	English Muffin
2	T.	margarine
1	T.	jam
2	pkg	sugar
8	oz	coffee
8	oz	hot tea

Lunch (2)

Subject Name _____

Date _____

Amount	Unit	Food Item
4	slices	Whole Wheat Bread
1/2	cup	Tuna, water packed
2	T.	Mayonnaise
2	leaves	lettuce
1/2	each	tomato slices
1/2	cup	celery sticks
1	large	carrot stick
1	each	pear
1	cup	milk, lowfat
1	cup	apple juice

Dinner (2)

Subject Name _____

Date _____

Snack (2)

Subject Name _____

Date _____

Amount	Unit	Food Item	Amount	Unit	Food Item
6 3/4	oz	Southern Fried Chicken Patty	3	cups	popcorn, plain
		w/Vegetable Medley			
1/2	cup	mashed potatoes			
1/4	cup	gravy			
1	cup	carrot raisin sld			
1	each	hard roll			
1	T.	margarine			
1	cup	ice cream			
1	pkg	sugar			
8	oz	coffee			
8	oz	hot tea			

Breakfast (3)

Subject Name _____

Date _____

Lunch (3)

Subject name _____

Date _____

Amount Unit Food Item

8	oz	apple juice
1/2	each	grapefruit
1	cup	shredded wheat
1	cup	milk, lowfat
1	each	bagel
1	oz	cream cheese
2	pkg	sugar
8	oz	coffee
8	oz	hot tea

Amount Unit Food Item

4	slices	whole wheat bread
3	oz	turkey breast
2	leaves	lettuce
2	T.	mayonnaise
5	each	radishes
1	large	carrot stick
1	cup	fruit salad
2	each	cookies
1	cup	milk, lowfat

Dinner (3)

Subject Name _____

Date _____

Amount	Unit	Food Item
9 1/4	oz	beef steak w/carrots
1	each	baked potato
1/4	cup	sour cream
1	cup	tossed salad
1	T.	1000 island dressing
2	each	dinner roll
2	T.	margarine
8	oz	grape juice
1	serving	surprise pie
1	pkg	sugar
8	oz	coffee
8	oz	tea

Snack (3)

Subject Name _____

Date _____

Amount	Unit	Food Item
3/4	cup	raisin, unsalted nut, coconut mix

Breakfast (*)

Subject name _____

Date _____

Lunch (*)

Subject name _____

Date _____

Amount	Unit	Food Item	Amount	Unit	Food Item
8	oz	orange juice	10	each	crackers, unsalted
1	each	fresh banana	1	bowl	Chef's salad
1/2	cup	grapenuts	2	T.	italian dressing
1	cup	milk, lowfat	1	each	fresh apple
2	slices	toast	1	cup	milk, lowfat
1	T.	margarine			
1	T.	jelly			
2	pkg.	sugar			
8	oz	coffee			
8	oz	hot tea			

Dinner (4)

Subject Name _____

Date _____

Snack (4)

Subject Name _____

Date _____

Amount	Unit	Food Item	Amount	Unit	Food Item
10	oz	Chicken cacciatore w/spaghetti	3	cups	popcorn, plain
1/2	cup	green beans			
1	cup	tossed salad			
1	T	Blue cheese dressing			
2	slices	french bread			
1	T.	margarine			
1	serving	Carrot Cake			
8	oz	cranberry juice cocktail			
1	pkg	sugar			
8	oz	coffee			
8	oz	hot tea			

Breakfast (5)

Subject Name _____

Date _____

Amount	Unit	Food Item
8	oz	grape juice
1	each	fresh orange
1	cup	wheat flakes
1	cup	milk, lowfat
2	each	doughnut, cake type
2	pkg	sugar
8	oz	coffee
8	oz	hot tea

Lunch (5)

Subject Name _____

Date _____

Amount	Unit	Food Item
4	slices	whole wheat bread
3	oz	roast beef, lean
2	leaves	lettuce
2	T.	Mayonnaise
1	cup	tossed salad
1	T.	french dressing
1	each	fresh fruit
1	cup	milk, lowfat

Dinner (5)

Subject Name _____

Date _____

Snack (5)

Subject Name _____

Date _____

Amount	Unit	Food Item	Amount	Unit	Food Item
15 1/4	oz	sliced turkey w/gravy & stuffing	2	T.	peanut butter
		w/broccoli and carrots	4	each	graham crackers
1/8	cup	cranberry sauce			
2	each	dinner roll			
1	T.	margarine			
1/2	cup	coleslaw			
1	serving	Surprise Cake			
2	pkg	sugar			
8	oz	coffee			
8	oz	hot tea			

Breakfast (6)

Subject name _____

Date _____

Lunch (6)

Subject name _____

Date _____

Amount Unit Food Item

8	oz	orange juice
1/2	each	grapefruit
1/2	cup	grapefruit
1	cup	milk, lowfat
1	each	toasted bagel
1	oz	cream cheese
2	pkg	sugar
8	oz	coffee
8	oz	hot tea

Amount Unit Food Item

1	each	hamburger bun
3	oz	hamburger
1	T.	mayonnaise
1/2	each	tomato slices
2	leaves	lettuce
1	slice	onion
2	T.	catsup
1/2	cup	cottage fries
1	cup	milk, lowfat
1	each	apple

Dinner (6)

Subject Name _____

Date _____

Amount	Unit	Food Item
8	oz	New England Clam Chowder
5	each	crackers, unsalted
11	oz	Lasagna
1/2	cup	peas
1	cup	tossed salad
1	T.	italian dressing
2	slices	Boston Brown Bread
1	T.	margarine
1	serving	Cheesecake
1	pkg	sugar
8	oz	coffee
8	oz	hot tea

Snack (6)

Subject Name _____

Date _____

Amount	Unit	Food Item
3/4	cup	raisin, unsalted nut,
		chocolate chip mix

Breakfast (7)

Subject Name _____

Date _____

Lunch (7)

Subject name _____

Date _____

Amount Unit Food Item

8	oz	apple juice
1	each	fresh banana
1	cup	40% Bran flakes
1	cup	milk, lowfat
1	each	English Muffin
1	T	Margarine
1	T.	Jelly
2	pkg	sugar
8	oz	coffee
8	oz	hot tea

Amount Unit Food Item

4	slices	whole wheat bread
2	egg	egg salad
2	leaves	lettuce
1/2	each	tomato wedges
1/2	cup	cauliflower, raw
1	large	carrot stick
1	cup	fruit salad
2	each	oatmeal cookies
1	cup	milk, lowfat
8	oz	orange juice

Dinner (7)

Subject Name _____

Date _____

Snack (7)

Subject Name _____

Date _____

Amount	Unit	Food Item	Amount	Unit	Food Item
9	oz	Sweet & Sour chicken	2	T.	peanut butter
		w/veg. Oriental	10	each	soda crackers
1/2	cup	rice			
1	cup	tossed salad			
1	T.	1000 dressing			
1	serving	apple pie			
1	each	hard roll			
1	T.	margarine			
2	pkg	sugar			
8	oz	coffee			
8	oz	hot tea			

Dinner (8)

Name _____

Date _____

Amount	Unit	Food Item
8	oz	grilled pork chops
1/4	cup	gravy
1	ea	baked potato
1/4	cup	sour cream
1/2	ea	baked acorn squash w/brown sugar and butter
1	cup	tossed salad
1	T	french dressing
2	ea	dinner rolls
1	T.	Margarine
1	cup	ice cream
8	oz	coffee
8	oz	hot tea

SPECIAL MENUS

Special Breakfast

Special Lunch

Subject Name _____

Subject Name _____

Date 19 Oct 85Date 19 Oct 85

Amount	Unit	Food Item	Amount	Unit	Food Item
1	cup	orange juice	1	each	hard roll
1	each	banana	4	oz	roast chicken
1	cup	Fruit and Fiber Cereal	2	T.	mayonnaise
1	each	muffin	2	leaves	lettuce
1	T.	margarine	1	stalk	celery stick stuffed w/peanut butter
1	cup	milk, lowfat	5	each	radishes
2	pkgs	sugar	2	each	cookies
1	cup	coffee	2	cups	apple juice
1	cup	hot tea	1	cup	milk, lowfat

Special Dinner

Subject Name _____

Date 19 Oct 85

Amount	Unit	Food Item
	slice	Pizza (Pans will be sent into chamber. List amounts after you eat the pizza).
		cheese
		hamburger
		green peppers, onions, mushrooms, and jalapenos
1	cup	tossed salad
1	T.	1,000 island dressing
1	cup	sherbert
1	pkg	sugar
1	cup	coffee
1	cup	hot tea

Breakfast (1)

Subject Name _____
Date _____

Lunch (1)

Subject Name _____
Date _____

Amount	Unit	Food Item	Amount	Unit	Food Item
3	oz.	Orange Juice	1	cup	Cream of Tomato Soup
2	each	Scrambled eggs	2	cups	Beef & Green Bean Casserole
1	cup	Hash Browned Potatoes			or
1	cup	raisin bran	2	cups	Green Bean Casserole
1	cup	lowfat milk			
2	slices	toast			
1	T.	Margarine	1	each	Fresh banana
1	T.	Jelly	1	pkg	sugar
2	pkg	sugar	8	oz	coffee
8	oz	coffee	8	oz	hot tea
8	oz	hot tea	1	pkg	salt
1	pkg	salt			

Dinner (7)

Subject Name _____

Date _____

Snack (7)

Subject Name _____

Date _____

Amount	Unit	Food Item	Amount	Unit	Food Item
1/4		Chicken w/Spicy Mushroom Gravy	2	T.	peanut butter
1	cup	rice	10	each	soda crackers
1/4		or			
1	cup	Roasted Chicken			
1	cup	Sweet Potato Casserole			
1	cup	tossed salad			
1	T.	1000 dressing			
1	serving	apple pie			
1	each	hard roll			
1	T.	margarine			
2	pkg	sugar			
8	oz	coffee			
8	oz	hot tea			

Breakfast (8)

Name _____

Date _____

Lunch (8)

Name _____

Date _____

Amount	Unit	Food Item	Amount	Unit	Food Item
8	oz	orange juice	2	cups	Lipton's Chicken Noodle Soup
2	slices	french toast	2	cups	Tuna Noodle Casserole
2	pats	butter			
1/4	cup	syrup			
1	oz	ham, grilled	1	stalk	Celery Stuffed w/Peanut Butter
1 1/2	cup	100% Granola Cereal			
1	cup	milk, lowfat	8	oz	cranberry juice
8	oz	coffee	1	ea	fresh orange
8	oz	tea	1	cup	milk, lowfat
2	t.	sugar	1	pkg	salt
1	pkg	salt			

Dinner (8)

Name _____

Date _____

Amount	Unit	Food Item
1		Broiled Steak w/ Onions & Mushrooms
1	ea	baked potato
1/4	cup	sour cream
1/2	ea	baked acorn squash w/brown sugar and butter
1	cup	tossed salad
1	T	french dressing
2	ea	dinner rolls
1	T.	Margarine
1	cup	ice cream
8	oz	coffee
8	oz	hot tea
1	pkg	salt

Dinner (7)

Name _____

Date _____

Amount	Unit	Food Item	Amount	Unit	Food Item
1/4		chicken, roasted season w/spices or w/ homemade Shake N Bake	2	salad leaves or	lettuce
8	ounce or	sliced turkey	1	cup	spinach
1	cup or	tuna	1	leaf or	chinese cabbage
2	ounces or	cheese + 2 oz different cheese	1	wedge	red cabbage
1/4	pound	tofu	1	each	tomato
1	ea or	baked potato	1	stalk	celery
1/2	ea	baked squash + 1 T. brown sugar + 2 pats butter	1/4	ea	red onion or 2 stalks green onion
1	or cup	brown rice	1/4	ea	cucumber or green pepper
1	ea or	green apple or 1/4 melon	1/2	ea	zucchini
1	pint or	Ben & Jerry's Ice Cream	1	large	carrot
2	cups or	mixed fruit	1	cup	parsley or basil or cilantio
1/8	serving or	pie	1/4	cup	bean sprouts or alfalfa sprouts
4	ea	cookies	1/4	cup	garbanzo beans or kidney beans
3	slices or	Boston Brown Bread			
1	ea or	hard roll			
2	or ea	rolls			

APPENDIX 2

APPENDIX 2 LEGENDS

Daily fluid intake and output raw data.

N=Subject Number,

C_Date=Calendar Date,

B_Intake=Fluid intake (oz) at breakfast,

L_Intake=Fluid intake (oz) at lunch,

D_Intake=Fluid intake (oz) at dinner,

ADLIB_6218=Intake (oz) of fluids available ad libitum 0600-1800 hours,

ADLIB_1826=Intake (oz) of fluids available ad libitum 1800-0600 hours,

Urine_6218=Urinary output 0600-1800 hours,

Urine_1826=Urinary output 1800-0600 hours,

T_Intake=Total fluid intake (cc)/24 hr period (B_Intake+L_Intake+D_Intake+
ADLIB_6218+ADLIB_1826),

T_Output=Total fluid output (cc) in a 24 hr period (Urine_6218+Urine_1826),

Balance=Fluid balance derived from T_Intake minus T_Output.

N	C_DATE	B_INTAKE	L_INTAKE	ADL_ID_0010	ADL_ID_0010	ADL_ID_1000	URINE_0010	URINE_1000	T_INTAKE	T_OUTPUT	BALANCE
1	07-0CT-05	24	20	0	0	10	2275	000	3040	3235	-505
2	07-0CT-05	16	0	40	0	0	1000	000	1000	1700	-50
3	07-0CT-05	24	24	32	32	52	1000	1000	4000	3300	1310
4	07-0CT-05	24	24	00	00	00	2400	1000	0000	4000	1300
5	07-0CT-05	16	0	50	50	00	2025	1100	0040	3770	1300
6	07-0CT-05	16	0	00	00	00	000	1100	3000	3000	1310
7	07-0CT-05	32	0	40	40	104	1000	1000	5100	3000	1510
8	07-0CT-05	24	0	20	20	0	000	000	1400	1100	200
9	07-0CT-05	24	0	24	24	0	000	000	1000	1000	1040
10	07-0CT-05	32	24	32	32	0	000	400	1000	1000	300
11	07-0CT-05	16	16	0	0	52	000	400	1000	1000	300
12	07-0CT-05	24	20	40	40	40	1000	1000	0040	1000	1040
13	07-0CT-05	24	20	44	44	0	1000	1000	0040	1000	300
14	07-0CT-05	32	0	00	00	32	1000	1170	0000	3000	2330
15	07-0CT-05	0	0	00	00	32	1300	000	2000	2000	300
16	07-0CT-05	24	16	100	100	00	400	1000	7000	2250	2070
17	07-0CT-05	24	16	44	44	00	1750	000	4000	2100	1000
18	07-0CT-05	32	20	0	0	32	400	1000	0000	3000	400
19	07-0CT-05	16	16	0	0	32	1000	1000	5200	2000	2000
20	07-0CT-05	24	20	02	02	12	1000	1000	3000	3000	0
21	07-0CT-05	16	16	00	00	70	2100	2000	0040	4700	040
22	07-0CT-05	24	16	24	24	12	2200	700	2500	2000	-400
23	07-0CT-05	20	20	40	40	00	000	2100	4400	2000	1540
24	07-0CT-05	24	20	20	20	0	000	200	2040	2000	040
25	07-0CT-05	32	20	24	24	32	1000	1000	3700	1100	
26	07-0CT-05	16	0	00	00	0	400	500	2100		
27	07-0CT-05	24	0	00	00	20	2000	2000	4000		
28	07-0CT-05	32	12	44	44	40	1000	1000	4000		
29	07-0CT-05	16	0	72	72	00	1000	1000	4000		
30	07-0CT-05	24	16	0	0	24	000	000	2000		
31	07-0CT-05	24	20	16	16	100	1000	2100	5000		
32	07-0CT-05	24	20	20	20	0	0	2100	5000		
33	07-0CT-05	16	0	00	00	20	0	2000	4000		
34	07-0CT-05	00	40	00	40	42	1100	2200	0400		
35	07-0CT-05	32	16	32	32	40	1000	1000	4200		
36	07-0CT-05	0	0	04	04	20	2000	1000	4000		
37	07-0CT-05	24	12	24	24	10	1000	1000	2500		
38	07-0CT-05	32	20	00	00	00	000	3200	0000		
39	07-0CT-05	24	0	52	52	0	0	400	2500		
40	07-0CT-05	24	20	0	0	104	1100	500	4000		
41	07-0CT-05	16	0	0	0	32	1000	1000	4000		
42	07-0CT-05	16	0	0	0	104	575	2375	4000	1700	1000
43	07-0CT-05	24	20	00	00	104	1025	1025	5500	3000	1070
44	07-0CT-05	24	20	00	00	32	1000	1000	4400	2570	1000
45	07-0CT-05	32	0	04	04	40	2000	1700	4000	4000	330
46	07-0CT-05	16	16	104	104	30	2000	1300	2040	2470	1300
47	07-0CT-05	24	12	40	40	30	1175	1300	5000	2000	3200
48	07-0CT-05	32	20	72	72	32	075	1300	5200	2000	1800
49	07-0CT-05	24	0	40	40	20	000	000	3400	1000	1000
50	07-0CT-05	24	0	0	0	20	1000	1000	2000	2000	000
51	07-0CT-05	32	16	50	50	32	2000	050	3040	3000	000
52	07-0CT-05	24	16	04	04	44	1400	2000	4000	3400	1300
53	07-0CT-05	24	16	36	36	20	2200	1275	2400	3070	-40
54	07-0CT-05	24	16	00	00	00	2200	2070	4000	4070	1400
55	07-0CT-05	0	0	00	00	00	1000	500	1000	2000	-1100
56	07-0CT-05	16	0	0	0	32	2000	1000	4000	4000	00
57	07-0CT-05	24	16	52	52	32	2400	1000	4000	4000	00
58	07-0CT-05	24	16	40	40	0	1000	000	2700	300	300
59	07-0CT-05	24	16	0	0	12	1000	1100	2000	2000	340
60	07-0CT-05	16	16	0	0	0	1200	500	1500	1700	-400
61	07-0CT-05	24	16	32	32	22	1700	1200	2000	2000	100
62	07-0CT-05	24	16	0	0	0	1000	1000	3000	3170	100
63	07-0CT-05	16	16	44	44	10	2000	2000	5040	4300	000
64	07-0CT-05	0	0	70	70	02	075	1100	2040	1070	1000
65	07-0CT-05	24	16	24	24	0	000	2000	4000	3000	2000
66	07-0CT-05	24	16	00	00	0	1000	1770	2500	2000	-000

C_DATE	B_INTAKE	L_INTAKE	ADLIB	ADLIB_0210	ADLIB_1000	UKDME	UKDME_0210	UKDME_1000	T_INTAKE	T_OUTPUT	BALANCE
15-OCT-05	32	24	0	0	0	0	0	0	2700	2675	25
16-OCT-05	16	0	0	0	0	0	0	0	720	1175	-455
17-OCT-05	24	16	0	0	0	0	0	0	4200	4000	200
18-OCT-05	24	16	0	0	0	0	0	0	4400	2775	1625
19-OCT-05	0	0	0	0	0	0	0	0	4100	4425	-325
20-OCT-05	16	16	0	0	0	0	0	0	1800	1400	400
21-OCT-05	16	16	0	0	0	0	0	0	2150	2425	-275
22-OCT-05	24	16	0	0	0	0	0	0	1875	2025	-150
23-OCT-05	24	16	0	0	0	0	0	0	2040	2050	-10
24-OCT-05	16	24	0	0	0	0	0	0	1200	4000	-2800
25-OCT-05	16	24	0	0	0	0	0	0	1200	4000	-2800
26-OCT-05	16	24	0	0	0	0	0	0	1200	4000	-2800
27-OCT-05	16	24	0	0	0	0	0	0	1200	4000	-2800
28-OCT-05	16	24	0	0	0	0	0	0	1200	4000	-2800
29-OCT-05	16	24	0	0	0	0	0	0	1200	4000	-2800
30-OCT-05	16	24	0	0	0	0	0	0	1200	4000	-2800
31-OCT-05	16	24	0	0	0	0	0	0	1200	4000	-2800
01-NOV-05	16	24	0	0	0	0	0	0	1200	4000	-2800
02-NOV-05	16	24	0	0	0	0	0	0	1200	4000	-2800
03-NOV-05	16	24	0	0	0	0	0	0	1200	4000	-2800
04-NOV-05	16	24	0	0	0	0	0	0	1200	4000	-2800
05-NOV-05	16	24	0	0	0	0	0	0	1200	4000	-2800
06-NOV-05	16	24	0	0	0	0	0	0	1200	4000	-2800
07-NOV-05	16	24	0	0	0	0	0	0	1200	4000	-2800
08-NOV-05	16	24	0	0	0	0	0	0	1200	4000	-2800
09-NOV-05	16	24	0	0	0	0	0	0	1200	4000	-2800
10-NOV-05	16	24	0	0	0	0	0	0	1200	4000	-2800
11-NOV-05	16	24	0	0	0	0	0	0	1200	4000	-2800
12-NOV-05	16	24	0	0	0	0	0	0	1200	4000	-2800
13-NOV-05	16	24	0	0	0	0	0	0	1200	4000	-2800
14-NOV-05	16	24	0	0	0	0	0	0	1200	4000	-2800
15-NOV-05	16	24	0	0	0	0	0	0	1200	4000	-2800
16-NOV-05	16	24	0	0	0	0	0	0	1200	4000	-2800
17-NOV-05	16	24	0	0	0	0	0	0	1200	4000	-2800
18-NOV-05	16	24	0	0	0	0	0	0	1200	4000	-2800
19-NOV-05	16	24	0	0	0	0	0	0	1200	4000	-2800
20-NOV-05	16	24	0	0	0	0	0	0	1200	4000	-2800
21-NOV-05	16	24	0	0	0	0	0	0	1200	4000	-2800
22-NOV-05	16	24	0	0	0	0	0	0	1200	4000	-2800
23-NOV-05	16	24	0	0	0	0	0	0	1200	4000	-2800
24-NOV-05	16	24	0	0	0	0	0	0	1200	4000	-2800
25-NOV-05	16	24	0	0	0	0	0	0	1200	4000	-2800
26-NOV-05	16	24	0	0	0	0	0	0	1200	4000	-2800
27-NOV-05	16	24	0	0	0	0	0	0	1200	4000	-2800
28-NOV-05	16	24	0	0	0	0	0	0	1200	4000	-2800
29-NOV-05	16	24	0	0	0	0	0	0	1200	4000	-2800
30-NOV-05	16	24	0	0	0	0	0	0	1200	4000	-2800
01-DEC-05	16	24	0	0	0	0	0	0	1200	4000	-2800
02-DEC-05	16	24	0	0	0	0	0	0	1200	4000	-2800
03-DEC-05	16	24	0	0	0	0	0	0	1200	4000	-2800
04-DEC-05	16	24	0	0	0	0	0	0	1200	4000	-2800
05-DEC-05	16	24	0	0	0	0	0	0	1200	4000	-2800
06-DEC-05	16	24	0	0	0	0	0	0	1200	4000	-2800
07-DEC-05	16	24	0	0	0	0	0	0	1200	4000	-2800
08-DEC-05	16	24	0	0	0	0	0	0	1200	4000	-2800
09-DEC-05	16	24	0	0	0	0	0	0	1200	4000	-2800
10-DEC-05	16	24	0	0	0	0	0	0	1200	4000	-2800
11-DEC-05	16	24	0	0	0	0	0	0	1200	4000	-2800
12-DEC-05	16	24	0	0	0	0	0	0	1200	4000	-2800
13-DEC-05	16	24	0	0	0	0	0	0	1200	4000	-2800
14-DEC-05	16	24	0	0	0	0	0	0	1200	4000	-2800
15-DEC-05	16	24	0	0	0	0	0	0	1200	4000	-2800
16-DEC-05	16	24	0	0	0	0	0	0	1200	4000	-2800
17-DEC-05	16	24	0	0	0	0	0	0	1200	4000	-2800
18-DEC-05	16	24	0	0	0	0	0	0	1200	4000	-2800
19-DEC-05	16	24	0	0	0	0	0	0	1200	4000	-2800
20-DEC-05	16	24	0	0	0	0	0	0	1200	4000	-2800
21-DEC-05	16	24	0	0	0	0	0	0	1200	4000	-2800
22-DEC-05	16	24	0	0	0	0	0	0	1200	4000	-2800
23-DEC-05	16	24	0	0	0	0	0	0	1200	4000	-2800
24-DEC-05	16	24	0	0	0	0	0	0	1200	4000	-2800
25-DEC-05	16	24	0	0	0	0	0	0	1200	4000	-2800
26-DEC-05	16	24	0	0	0	0	0	0	1200	4000	-2800
27-DEC-05	16	24	0	0	0	0	0	0	1200	4000	-2800
28-DEC-05	16	24	0	0	0	0	0	0	1200	4000	-2800
29-DEC-05	16	24	0	0	0	0	0	0	1200	4000	-2800
30-DEC-05	16	24	0	0	0	0	0	0	1200	4000	-2800
31-DEC-05	16	24	0	0	0	0	0	0	1200	4000	-2800

N 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

N	C_DATE	B_INTAKE	L_INTAKE	ADLIB_0216	ADLIB_1926	URINE_0216	URINE_1926	T_INTAKE	T_OUTPUT	BALANCE
1	23-OCT-85	24	12	32	24	769	1900	2349	2609	740
2	23-OCT-85	16	16	29	64	1725	1200	2409	2925	533
3	23-OCT-85	44	44	64	22	1669	3109	4326	4969	-636
4	23-OCT-85	0	12	28	32	1669	2109	2409	2609	-1209
5	23-OCT-85	0	0	146	64	2609	1909	6409	6409	909
6	23-OCT-85	0	0	88	96	1109	1969	6249	2969	3199
7	23-OCT-85	24	0	88	0	1409	659	2949	2969	-16
8	23-OCT-85	16	16	28	0	1409	659	2949	2969	649
9	24-OCT-85	16	0	66	16	1809	1209	2909	2409	-1449
1	24-OCT-85	0	0	16	0	1209	1209	909	2409	-2309
2	24-OCT-85	0	0	44	0	3109	1309	2949	4409	-2309
3	24-OCT-85	24	0	69	48	2109	2309	4209	4409	-269
4	24-OCT-85	16	0	88	199	1809	2409	6126	5309	929
5	24-OCT-85	0	0	72	64	1969	3409	6449	6409	-309
6	24-OCT-85	16	0	16	24	659	1509	2109	2159	16
7	24-OCT-85	24	0	16	56	769	459	2849	1159	1499
8	25-OCT-85	16	0	0	32	409	1559	2109	1959	219
9	25-OCT-85	16	24	0	12	1809	1259	4859	3959	1099
1	25-OCT-85	24	0	91	12	1809	1259	4859	3959	1099
2	25-OCT-85	24	16	69	64	1409	1909	5109	3209	1909
3	25-OCT-85	16	0	93	56	2609	2525	4826	5325	-935
4	25-OCT-85	0	0	0	89	1809	2609	2648	4499	-1709
5	25-OCT-85	24	0	0	8	525	625	1209	1325	-125
6	25-OCT-85	24	0	0	48	1825	709	2709	1725	1825
7	25-OCT-85	12	0	0	24	299	759	1699	959	739
8	26-OCT-85	16	0	96	22	3409	2709	5826	6109	-209
9	26-OCT-85	16	32	48	32	1925	2825	4926	4559	379
1	26-OCT-85	24	12	0	68	859	2559	4449	3409	1949
2	26-OCT-85	0	0	72	32	1559	2159	3849	3709	149
3	26-OCT-85	16	16	64	24	399	675	3869	875	2105
4	26-OCT-85	16	22	24	32	2909	1209	3729	3209	529
5	27-OCT-85	0	0	0	92	2909	1669	2869	3959	-170
6	27-OCT-85	16	0	32	32	2259	2325	5949	4575	405
7	27-OCT-85	32	0	64	32	2309	2725	6309	4725	75
8	27-OCT-85	16	0	76	52	2909	3175	6369	5175	1195
9	27-OCT-85	0	0	64	124	2919	2525	2899	4335	-1855
1	27-OCT-85	16	0	32	32	699	1275	1809	2975	-275
2	27-OCT-85	0	0	29	0	299	809	2979	1809	1879
3	28-OCT-85	16	0	0	48	299	809	2979	1809	1879
4	28-OCT-85	0	0	0	32	299	609	1209	909	409
5	28-OCT-85	0	64	0	57	1959	1775	3725	3725	1845
6	28-OCT-85	32	0	69	56	2409	2175	4699	4575	105
7	28-OCT-85	0	0	96	199	4609	3909	6309	7899	-1249
8	28-OCT-85	0	0	0	64	2109	2475	4669	4575	-16
9	28-OCT-85	24	0	0	0	659	625	1449	1175	265
1	29-OCT-85	24	0	0	0	699	1309	2229	2169	129
2	29-OCT-85	16	0	0	42	809	809	3369	2859	719
3	29-OCT-85	0	29	32	36	1809	2975	4609	5475	-795
4	29-OCT-85	24	16	49	49	2609	2975	4609	5475	-95
5	29-OCT-85	0	0	64	44	2409	1175	3409	3575	-95
6	29-OCT-85	0	0	48	48	1759	2275	3609	4925	-425
7	29-OCT-85	16	0	88	0	1109	1369	2409	2469	-69
8	29-OCT-85	0	0	69	0	1909	1369	3129	1699	1479
9	30-OCT-85	0	29	0	44	359	1259	1929	1699	329
1	30-OCT-85	16	16	32	32	2175	2909	2909	4175	-1295
2	30-OCT-85	16	0	32	32	3209	2975	6099	6175	-175
3	30-OCT-85	32	24	69	68	2209	3209	6409	6325	955
4	30-OCT-85	0	0	64	144	2325	3209	6409	6325	955
5	30-OCT-85	0	0	48	44	1559	1759	2909	3369	-309
6	30-OCT-85	0	0	32	0	699	975	3529	1575	945
7	31-OCT-85	0	24	0	0	699	975	3529	1575	945
8	31-OCT-85	16	0	32	28	1975	1975	3249	3249	0
9	31-OCT-85	16	16	0	24	859	2109	2109	2109	0
1	31-OCT-85	29	24	32	24	1409	1409	4449	4449	0
2	31-OCT-85	14	0	72	32	2475	2475	4149	4149	0
3	31-OCT-85	0	0	16	59	1409	1409	2409	2409	0

C_DATE	B_INTRAKE	L_INTRAKE	ADL_IN_0210	ADL_IN_1000	URTIME_0210	URTIME_1000	T_INTAKE	T_OUTPUT	BALANCE
01-OCT-05	24	10	04	0	0	2475	3100	0	0
02-OCT-05	20	20	40	00	750	2150	4000	0	105
03-OCT-05	20	10	00	00	1750	1900	3040	2675	200
04-OCT-05	10	0	00	40	1750	1000	2150	2750	-1400
05-OCT-05	20	22	00	00	2025	3125	4000	0	-2770
06-OCT-05	20	10	40	00	2700	2000	4000	0	-100
07-OCT-05	0	0	00	00	1500	1000	3000	2700	-400
08-OCT-05	10	20	12	0	0	0	1000	2100	-100
09-OCT-05	20	24	40	0	0	0	3000	0	-0
10-OCT-05	0	20	10	40	400	2050	2000	2000	0
11-OCT-05	0	0	10	00	0	1975	2000	0	0
12-OCT-05	20	10	00	40	0	2100	4000	0	0
13-OCT-05	0	0	00	00	2025	2000	2400	0	0
14-OCT-05	0	24	0	0	1075	1075	1000	0	0
15-OCT-05	0	10	00	17	1100	1100	2450	0	1100
16-OCT-05	0	10	00	0	700	700	2200	1400	0
17-OCT-05	0	10	10	0	1000	1000	2100	0	-040
18-OCT-05	0	0	10	00	1000	1000	2000	2250	750
19-OCT-05	10	0	00	00	1025	2000	3120	4425	-1000
20-OCT-05	0	0	00	00	2450	2000	2400	0	-10250
21-OCT-05	0	0	40	00	1200	1725	3120	2925	100
22-OCT-05	0	10	44	0	000	075	2040	1775	200
23-OCT-05	10	12	00	0	0	0	1000	1400	200
24-OCT-05	0	0	00	00	450	0	1000	1170	1170
25-OCT-05	0	24	0	0	1000	1000	3040	2000	040
26-OCT-05	0	0	00	00	2000	2350	4250	0	-0
27-OCT-05	0	0	00	00	3750	4000	5700	7750	-1000
28-OCT-05	10	0	00	120	3750	1200	3000	2000	200
29-OCT-05	10	20	0	0	0	0	1000	1000	-470
30-OCT-05	0	0	0	0	425	1000	1000	1425	200
31-OCT-05	20	0	0	10	200	1000	1440	1000	140
01-NOV-05	20	0	00	00	0	2000	3000	2000	-200
02-NOV-05	24	0	00	00	350	2000	2000	3000	-1025
03-NOV-05	22	10	120	00	4075	3750	7000	7025	-145
04-NOV-05	24	0	00	00	1050	1400	2040	2450	1200
05-NOV-05	10	0	00	00	0	0	1000	1040	140
06-NOV-05	0	0	00	00	0	0	2400	1400	1000
07-NOV-05	0	10	00	00	0	0	1000	1000	0
08-NOV-05	0	0	04	42	0	2100	4200	4700	-000
09-NOV-05	10	24	04	112	4000	2000	0000	0000	-000
10-NOV-05	10	24	00	40	1400	1000	2040	2040	-110
11-NOV-05	10	0	00	00	0	0	2000	1150	1000
12-NOV-05	10	0	0	40	025	1250	2520	1075	045
13-NOV-05	0	10	0	0	0	0	0	0	-000
14-NOV-05	0	20	0	0	1750	1000	1000	2250	-1000
15-NOV-05	0	0	0	0	0	0	400	0	-1000
16-NOV-05	0	10	00	00	2225	2225	4200	5400	-1000
17-NOV-05	0	0	00	00	1150	1075	1020	2025	-000
18-NOV-05	0	0	00	00	0	0	2040	1000	000
19-NOV-05	0	0	00	00	0	0	1000	1000	000
20-NOV-05	0	0	00	00	0	0	1000	1000	000
21-NOV-05	0	0	00	00	0	0	1000	1000	000
22-NOV-05	0	0	00	00	0	0	1000	1000	000
23-NOV-05	0	0	00	00	0	0	1000	1000	000
24-NOV-05	0	0	00	00	0	0	1000	1000	000
25-NOV-05	0	0	00	00	0	0	1000	1000	000
26-NOV-05	0	0	00	00	0	0	1000	1000	000
27-NOV-05	0	0	00	00	0	0	1000	1000	000
28-NOV-05	0	0	00	00	0	0	1000	1000	000
29-NOV-05	0	0	00	00	0	0	1000	1000	000
30-NOV-05	0	0	00	00	0	0	1000	1000	000
01-NOV-05	24	0	00	00	0	0	1000	1000	000
02-NOV-05	24	0	00	00	0	0	1000	1000	000
03-NOV-05	24	0	00	00	0	0	1000	1000	000
04-NOV-05	24	0	00	00	0	0	1000	1000	000
05-NOV-05	24	0	00	00	0	0	1000	1000	000
06-NOV-05	24	0	00	00	0	0	1000	1000	000
07-NOV-05	24	0	00	00	0	0	1000	1000	000
08-NOV-05	24	0	00	00	0	0	1000	1000	000
09-NOV-05	24	0	00	00	0	0	1000	1000	000
10-NOV-05	24	0	00	00	0	0	1000	1000	000
11-NOV-05	24	0	00	00	0	0	1000	1000	000
12-NOV-05	24	0	00	00	0	0	1000	1000	000
13-NOV-05	24	0	00	00	0	0	1000	1000	000
14-NOV-05	24	0	00	00	0	0	1000	1000	000
15-NOV-05	24	0	00	00	0	0	1000	1000	000
16-NOV-05	24	0	00	00	0	0	1000	1000	000
17-NOV-05	24	0	00	00	0	0	1000	1000	000
18-NOV-05	24	0	00	00	0	0	1000	1000	000
19-NOV-05	24	0	00	00	0	0	1000	1000	000
20-NOV-05	24	0	00	00	0	0	1000	1000	000
21-NOV-05	24	0	00	00	0	0	1000	1000	000
22-NOV-05	24	0	00	00	0	0	1000	1000	000
23-NOV-05	24	0	00	00	0	0	1000	1000	000
24-NOV-05	24	0	00	00	0	0	1000	1000	000
25-NOV-05	24	0	00	00	0	0	1000	1000	000
26-NOV-05	24	0	00	00	0	0	1000	1000	000
27-NOV-05	24	0	00	00	0	0	1000	1000	000
28-NOV-05	24	0	00	00	0	0	1000	1000	000
29-NOV-05	24	0	00	00	0	0	1000	1000	000
30-NOV-05	24	0	00	00	0	0	1000	1000	000
01-NOV-05	24	0	00	00	0	0	1000	1000	000
02-NOV-05	24	0	00	00	0	0	1000	1000	000
03-NOV-05	24	0	00	00	0	0	1000	1000	000
04-NOV-05	24	0	00	00	0	0	1000	1000	000
05-NOV-05	24	0	00	00	0	0	1000	1000	000
06-NOV-05	24	0	00	00	0	0	1000	1000	000
07-NOV-05	24	0	00	00	0	0	1000	1000	000
08-NOV-05	24	0	00	00	0	0	1000	1000	000
09-NOV-05	24	0	00	00	0	0	1000	1000	000
10-NOV-05	24	0	00	00	0	0	1000	1000	000
11-NOV-05	24	0	00	00	0	0	1000	1000	000
12-NOV-05	24	0	00	00	0	0	1000	1000	000
13-NOV-05	24	0	00	00	0	0	1000	1000	000
14-NOV-05	24	0	00	00	0	0	1000	1000	000
15-NOV-05	24	0	00	00	0	0	1000	1000	000
16-NOV-05	24	0	00	00	0	0	1000	1000	000
17-NOV-05	24	0	00	00	0	0	1000	1000	000
18-NOV-05	24	0	00	00	0	0	1000	1000	000
19-NOV-05	24	0	00	00	0	0	1000	1000	000
20-NOV-05	24	0	00	00	0	0	1000	1000	000
21-NOV-05	24	0	00	00	0	0	1000	1000	000
22-NOV-05	24	0	00	00	0	0	1000	1000	000
23-NOV-05	24	0	00	00	0	0	1000	1000	000
24-NOV-05	24	0	00	00	0	0	1000	1000	000
25-NOV-05	24	0	00	00	0	0	1000	1000	000
26-NOV-05	24	0	00	00	0	0	1000	1000	000
27-NOV-05	24	0	00	00	0	0	1000	1000	000
28-NOV-05	24	0	00	00	0	0	1000	1000	000
29-NOV-05	24	0	00	00	0	0	1000	1000	000
30-NOV-05	24	0	00	00	0	0	1000	1000	000
01-NOV-05	24	0	00	00	0	0	1000	1000	000
02-NOV-05	24	0	00	00	0	0	1000	1000	000
03-NOV-05	24	0	00	00	0	0	1000	1000	000
04-NOV-05	24	0	00	00	0	0	1000	1000	000
05-NOV-05	24	0	00	00	0	0	1000	1000	000
06-NOV-05	24	0	00	00	0	0	1000	1000	000
07-NOV-05	24	0	00	00	0	0	1000	1000	000
08-NOV-05	24	0	00	00	0	0	1000	1000	000
09-NOV-05	24	0	00	00	0	0	1000	1000	000
10-NOV-05	24	0	00	00	0	0	1000	1000	000
11-NOV-05	24	0	00	00	0	0	1000	1000	000
12-NOV-05	24	0	00	00	0	0	1000	1000	000
13-NOV-05	24	0	00	00	0	0	1000	1000	000
14-NOV-05	24	0	00	00	0	0	1000	1000	000
15-NOV-05	24	0	00	00	0	0	1000	1000	000
16-NOV-05	24	0	00	00	0	0	1000	1000	000
17-NOV-05	24	0	00	00	0	0	1000	1000	000
18-NOV-05	24	0	00	00	0	0	1000	1000	000
19-NOV-05	24	0	00	00	0	0	1000	1000	000
20-NOV-05	24	0	00	00	0	0	1000	1000	000
21-NOV-05	24	0	00	00	0	0	1000	1000	000
22-NOV-05	24	0	00	00	0	0	1000	1000	000
23-NOV-05	24	0	00	00	0	0	1000	1000	000
24-NOV-05	24	0	00	00	0	0	1000	1000	000
25-NOV-05	24	0	00	00	0	0	1000	1000	000
26-NOV-05	24	0	00	00	0	0	1000	1000	000
27-NOV-05	24	0	00	00	0	0	1000	1000	000
28-NOV-05	24	0	00	00	0	0	1000	1000</	

[illegible]

N	C_DATE	B_INTAKE	L_INTAKE	ADLIB	ADLIB_0210	ADLIB_1020	URINE_0210	URINE_1020	T_INTAKE	T_OUTPUT	BALANCE
3	10-NOV-85	14	16	0	0	0	200	1250	900	1400	-500
4	10-NOV-85	16	32	04	04	04	3350	1525	9000	4975	1000
0	10-NOV-85	0	0	120	120	112	2750	2575	7000	5325	2355
0	10-NOV-85	0	16	0	0	32	275	950	1000	1225	455
0	10-NOV-85	24	24	24	24	0	1100	1050	2400	2750	-350
1	11-NOV-85	0	0	0	0	0	1000	1150	720	2150	-1430
3	11-NOV-85	11	0	0	0	0	975	250	570	1225	-855
4	11-NOV-85	0	40	0	0	32	1350	1725	2400	3075	-875
0	11-NOV-85	16	0	0	0	64	3100	2575	2640	5675	-3035
0	11-NOV-85	16	0	0	0	32	1175	1500	1920	2075	-755
0	11-NOV-85	16	0	100	100	0	1850	3025	4200	5475	-1275
1	12-NOV-85	24	0	0	0	0	400	900	1000	1300	500
3	12-NOV-85	16	0	0	0	0	1300	475	720	1775	-1055
4	12-NOV-85	0	0	0	0	72	1075	600	3000	1675	1925
0	12-NOV-85	16	0	144	144	120	2100	3375	8500	6475	2105
0	12-NOV-85	0	0	40	40	32	2200	250	2400	2450	-50
1	13-NOV-85	0	0	0	0	0	2200	1925	720	4125	-3405
3	13-NOV-85	0	0	0	0	0	2000	1700	1920	3700	-1780
4	13-NOV-85	0	0	0	0	32	1000	250	900	1850	-850
0	13-NOV-85	0	0	0	0	32	2050	2000	900	4050	-3090
0	13-NOV-85	0	0	0	0	184	4500	3750	6400	9250	-1770
0	13-NOV-85	0	0	32	32	32	1100	1600	1920	2700	-780
0	13-NOV-85	0	0	0	0	0	1000	2425	300	4225	-3025
1	14-NOV-85	16	0	0	0	0	375	0	400	0	0
3	14-NOV-85	0	0	16	16	0	1500	0	2100	0	0
4	14-NOV-85	0	0	64	64	0	1800	0	1920	0	0
0	14-NOV-85	0	0	0	0	0	0	0	400	0	0
0	14-NOV-85	16	0	0	0	0	1075	0	720	0	0
0	05-OCT-85	16	0	0	0	20	450	350	1800	0	1000
0	05-NOV-85	16	0	16	16	45	750	3250	3030	4000	-970
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